Phase (I) Study on Evaluating the Effectiveness of the 'Empowering Learning and Teaching with Information Technology' Strategy (2004/2007)

Final Report

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by

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Statistical Symbols:

25% P'ile	Value in 25% of percentile
75% P'ile	Value in 75% of percentile
/LCL/	Lower 95% confidence limit
/Max/	Maximum value
/Min/	Minimum value
/N/	Total number of valid responses
/n/	Frequency count
/SD/	Standard deviation
/SE/	Standard error
/UCL/	Upper 95% confidence limit

Symbols for Special School Sector:

/H/	Hospital School
/HI/	School for Children with Hearing Impairment
/ID/	School for Children with Intellectual Disability - the special schools implementing special curriculum which include ID-M, ID-Mmod, ID-Mod and ID-S
/ID-M/	School for the Mildly Intellectually Disabled
/ID-Mmod/	School for the Mildly and Moderately Intellectually Disabled
/ID-Mod/	School for the Moderately Intellectually Disabled
/ID-S/	School for the Severely Intellectually Disabled
/NC/	Normal Curriculum (NC) schools - the special schools implementing mainstream curriculum which include the H, HI, PD, SSD and VI
/OC/	Occupational therapist
/PD/	School for Children with Physical Disability
/PHY/	Physiotherapist
/SPH/	Speech therapist
/SSD/	School for Social Development
/VI/	School for Children with Visual Impairment

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Executive Summary

Purposes of the Study

This Study was commissioned by the Education and Manpower Bureau (EMB) of the Government of the Hong Kong Special Administrative Region (HKSAR) to review the progress of the Information Technology in Education (ITEd) initiatives in Hong Kong as put forth in the strategic document "Empowering Learning and Teaching with Information Technology" (Second ITEd Strategy). The main purposes of this Study were:

a. to review the application of ITEd as related to school, teacher and student practices as well as the involvement of the community sector in ITEd;
b. to review the progress of the ITEd projects from 2004/05 to 2006/07 school years; and
c. to recommend necessary adjustments to the implementation of relevant projects as appropriate.

Methodology

A cross-sectional research design with two intervals of data collection, Main Study (I) (MS1) in October 2005 and Main Study (II) (MS2) in October 2006, was adopted in this Study. The data collected in MS1 became the base-line data of this Study, which were used for systematic review of the progress of various ITEd initiatives or projects at the first stage of the Second ITEd Strategy. The cross-sectional data collected in MS2 were subsequently compared with the data garnered in MS1 for tracking the progress of the implementation of ITEd from 2004/05 to 2006/07 school years.

Quantitative and qualitative methods were adopted in this Study to collect data during the two data collection periods. With regard to the collection of quantitative data, information about the application of IT in different school sectors (i.e. primary, secondary and special) in Hong Kong since the 2004/05 school year and the progress of the implementation of ITEd between the 2004/05 and the 2006/07 school years was gathered from school heads and school representatives/ITEd Team heads/IT coordinators (ITCs) of all school sectors as well as ITEd Team teachers, teachers (including therapists in special schools), students and parents of selected schools via anonymous questionnaire surveys. Eight separate sets of questionnaires were designed for different types of stakeholders correspondingly. A web-based platform, *Self-evaluation Platform (SEP) on ITEd for Schools*[*] developed by the EMB, was used for administering the online questionnaires for all stakeholders in schools. For parents and the majority of special school students, paper-based surveys were administered.

All schools in the three school sectors were invited to complete the School Head's ITEd Questionnaires and the School ITEd Survey (i.e. full enumeration) and around 10% to 15% of the schools were randomly selected for other stakeholders' surveys. The total number of schools in respective school sector involved in different surveys in MS1 and MS2 was as follows:

[*] The SEP was fully integrated into the E-platform for School Development and Accountability in 2006. For details, please visit http://www.emb.gov.hk/sep/eng (English version) or http://www.emb.gov.hk/sep/chin (Chinese version).

MS1

- *Full enumeration*
  623 primary schools (including Aided Schools, Direct Subsidy Schools and Government Schools); 471 secondary schools (including Aided Schools, Caput Schools, Direct Subsidy Schools and Government Schools); and 61 special schools [special schools were classified into six categories: Hospital School (H), School for Children with Hearing Impairment (HI), School for Children with Intellectual Disability (ID), School for Children with Physical Disability (PD), School for Social Development and School (SSD) for Children with Visual Impairment (VI)]
- *Sampled schools*
  68 primary schools, 72 secondary schools and 10 special schools

MS2

- *Full enumeration*
  549 primary schools, 468 secondary schools and 60 special schools
- *Sampled schools*
  72 primary schools, 72 secondary schools and 10 special schools

Generally speaking, the response rates of the questionnaire surveys for most of the stakeholder groups were over 70%. Table E.1 summarises the overall response rates of different stakeholder groups for MS1 and MS2.

Table E.1 Summary of overall response rates of different stakeholder groups for MS1 and MS2

Questionnaire types	Stakeholder groups	MS1		MS2	
		Total no. of responded stakeholders	Response rate	Total no. of responded stakeholders	Response rate
A. Full enumeration					
1. School Head's Information Technology in Education Questionnaire (Part 1)	School Heads	1002	87%	851	79%
2. School Head's Information Technology in Education Questionnaire (Part 2)	School Heads	987	85%	843	78%
3. School Information Technology in Education Survey	School representatives/ITEd Team heads/ITCs	992	86%	843	78%
B. Sampled schools					
4. Information Technology in Education Team Teachers' Questionnaire	ITEd Team Teachers	713	83%	592	70%
5. Teachers' Information Technology in Education Questionnaire	Teachers	4748	70%	4053	57%
6. Therapists' Information Technology in Education Questionnaire	Therapists	25	83%	27	96%
7. Students' Information Technology in Education Questionnaire	Students	10143	81%	9375	74%
8. Parents' Information Technology in Education Questionnaire	Parents of selected students	9501	76%	8214	65%

With respect to the collection of qualitative data, information about the involvement of the community in the implementation of the Second ITEd Strategy was garnered from the Community Group through focus group interviews. Nine focus group interviews (involving two IT-related organisations, three non-governmental organisations, two publishers and two tertiary institutions) were organised and conducted parallel to the data collection periods of MS1 and MS2. Opinions of the interviewees on the goals and roles, relevant work, contributions and suggestions of the Community Group regarding the implementation of ITEd in Hong Kong were collected.

Summary of Findings

Empowering Learners with IT

The findings showed that primary and secondary school students were generally capable of using different types of software with different degree of proficiency. However, the fundamental skill, such as Chinese input was expected to be strengthened especially at the lower primary class levels. Students from special schools of Normal Curriculum (NC)[**] showed similar level of proficiency in using software and hardware as the primary and secondary school students whereas the students with Intellectual Disability (ID) rated themselves as not proficient.

Students' level of proficiency in using software for communication and information searching purposes increased from P4 to P6 and kept steady in the secondary classes. The findings also showed that students' level of proficiency in information processing and analysis software declined from S2 to S6. The above phenomena might be the result of the increased project-based learning activities in the primary schools and the examination-driven curriculum in the upper secondary classes.

The findings illustrated that students had a reasonable level of awareness of the social and ethical issues relating to the use of IT. However, primary and secondary school students were less concerned about the inappropriateness of sending or forwarding unnecessary e-mails or messages and secondary school students even showed less concern about using pirated software.

The surveyed students showed positive perceptions of learning with IT. The major positive impacts of the use of IT on learning, as perceived by the students, were widening perspective through more interaction with the outside world, enhancing students' interest in self-learning of subject content and enhancing information processing ability. In contrast, the level of agreement on the effect of using IT to enhance communication and presentation skills was found to be the lowest among the primary and secondary school students.

The design of content and pedagogy for the IT curriculum was, in general, suitable for students. The findings showed that primary and secondary schools closely followed the guidelines as stated in *Information Technology Learning Targets* (CDC, 2000) to prepare learning and teaching activities in order to develop the capability of students in using IT. However, it was found that there was room for improvement in the current teaching practices which had not completely addressed the social and ethical issues relating to the use of IT.

The diversity of student learning activities which involved the use of IT was generally rich. This Study showed that students had engaged in different types of learning activities which involved the use of IT. However, the nature of these activities was mainly confined to tasks about information search. The number of activities related to information selection, information collation and analysis, report and presentation as well as self-evaluation on learning outcomes were relatively less. Nonetheless, it was encouraging to see that more student-centred activities which required the basic information literacy skill in information search were becoming popular and such a phenomenon had not been obvious in the previous evaluations.

Empowering Teachers with IT

The measures to equip teachers with the capacity of and confidence in embedding IT in teaching were effective in general. This Study showed that most of the surveyed teachers met the IT competency requirements. Teachers were well-trained and were capable of conducting teaching

[**] Normal Curriculum (NC) schools - the special schools implementing mainstream curriculum which include the H, HI, PD, SSD and VI

with the use of IT. The findings also revealed that teachers generally had confidence and were ready to incorporate higher-order learning opportunities with the use of IT.

It was found that IT was used frequently to support subject teaching like language subjects by the surveyed teachers in the three school sectors as well as General Studies in primary and special schools and quite a number of the surveyed teachers gave assignments that required the use of digital resources for subject learning at home.

The measures to provide teachers with the ITEd-related professional development opportunities were successfully implemented. The surveyed teachers asserted that the current ITEd professional development programmes and activities were practical and generally adequate. They believed that such programmes and activities could enhance their mastery of IT knowledge and skills and their capability of using IT for learning and teaching. The teachers also expressed that future ITEd professional development programmes or activities could focus on the use of new technology in teaching and the applications of IT in subject or cross-curricular teaching.

Enhancing School Leadership for the Knowledge Age

The measures to guide and support school heads and their associates to establish and realise visions and goals concerning the integration of IT into school contexts were generally effectual. The surveyed school heads were satisfied with their school ITEd plans covering the infrastructure requirements of the schools. However, the school heads showed a relatively lower level of satisfaction, but they were still very positive, with their school ITEd plans for having derived the content or measures for integrating IT into learning and teaching and for evaluating the effectiveness of the ITEd plans seriously.

The measures to support school heads and their associates to promote IT culture in school were effective to some extent. This Study revealed that the promotion of IT culture among schools and the education community was, to a certain extent, achieved at the school level. The surveyed primary and special school heads were satisfied that their schools continuously promoted collaborative team work and sharing among teachers on the use of IT for teaching whereas secondary school heads were slightly less satisfied with these aspects.

The measures to provide school heads and their associates with more flexibility in the allocation of resources for school-based IT plans were implemented successfully. The findings showed that the merging of various IT grants and the allowance for the flexible use of grants effectively enhanced schools' flexibility in allocating resources to support school-based ITEd plans. The findings also indicated that schools had made use of various funds, such as those from parents and other organisations, to support school-based ITEd initiatives apart from the Government funding.

Enriching Digital Resources for Learning

The measures to bring digital educational resources closer to the needs of individual schools were effective. The findings revealed that the surveyed school heads, teachers and students were quite satisfied with the provision of digital resources in schools. The findings also showed that although many digital resources had been developed during the period of the present study, there was still a great demand for suitable digital resources which could assist in teaching subject knowledge and facilitating students' development of higher-order thinking skills and generic skills.

Improving IT Infrastructure and Pioneering Pedagogy Using IT

The measures to improve the IT infrastructure of schools were effectual. The findings indicated that with extensive input and support from the EMB, IT infrastructure had been well set up in schools and improved significantly. Well-built IT infrastructure was available and ready for use in learning and teaching. The student-to-computer ratios were comparable to many advanced countries in the world and many of our general classrooms were installed with digital projectors.

Different groups of stakeholders showed their general satisfaction of the sufficiency in IT facilities and the Internet connectivity of IT equipment. The findings also revealed that schools had been improving the IT infrastructure by upgrading and replacing the obsolete hardware and adopting advanced technology to enhance the effectiveness of learning and teaching in schools.

Providing Continuous Research and Development

The measures to conduct research on the effectiveness of the ITEd strategy and the impact of IT on students' learning outcomes were successfully implemented in general. The EMB had initiated some researches and studies with the aim to consolidate and disseminate good practices for pioneering pedagogies, and commissioned a number of projects to relevant organisations to support the implementation and continuous development of ITEd in Hong Kong.

There was a piece of encouraging finding that some schools began to participate in or to initiate pilot projects or schemes for exploring the effectiveness of the innovative use of IT for the enhancement of learning and teaching. Although the percentage of schools which initiated ITEd-related projects was still low, it was found that pilot projects which involved school collaboration with other schools, local tertiary institutions, local community organisations and local commercial organisations were prevalent.

Promoting Community-wide Support and Community Building

The measures to promote co-operation between schools and parents in the implementation of school ITEd plans were effective in general. This Study revealed that the home-school collaboration and parents' involvement in the promotion of ITEd had been enhanced. Regarding the development of ITEd-related programmes for parents, the surveyed parents perceived that ITEd activities were quite sufficient and they were quite positive towards the outcomes derived from such programmes. The Study also revealed that the surveyed parents were concerned about the ethical, legal and health issues involved in children's use of IT. Regarding the enhancement of communication between schools and parents through the use of IT, the findings showed that the use of electronic means for such purpose was still uncommon.

The measures to encourage schools to enhance partnership with the IT industry on teacher training, digital resources and other related fields were generally effectual. The IT-related organisations in the community, such as those in the tertiary education, private and non-government sectors, showed different level of contribution to ITEd in terms of providing learning activities for students, training activities for teachers, and digital resources as well as conducting research projects. It was encouraging that quite a number of schools had involved in such community-school collaboration activities in pilot schemes or sharing activities related to the use of IT for teaching.

The measures to address digital divide among students were implemented successfully. This Study revealed that digital divide was less obvious in terms of the possession of home computers. Home computers were quite widely available for the surveyed students. However, when compared to the opportunities for students of other income group families, those for students of the low income group families to use IT for learning through the Internet at home were still relatively limited because of the unavailable Internet access or the slow Internet connection at home.

Major Recommendations

- **Empowering Learners with IT:** To equip students with the up-to-date knowledge about IT and the necessary skills of using the latest technology, it is worthwhile to make IT as a separate subject. In fact, the Study revealed that nearly all schools offered Computer/IT subjects. However, there is a need to reduce the repetition of learning contents of IT curriculum for primary and secondary school students by investigating the contents of IT curriculum for primary and secondary education so as to make a smooth and coherent transition between the curriculum for Computer Awareness in primary schools and the curriculum for Computer Literacy in secondary schools.

- **Empowering Teachers with IT:** To increase/maintain the competency and confidence of teachers in making good pedagogical use of IT, it is suggested that further professional development in ITEd should be continuously offered to teachers. The future direction of such professional development activities should focus on the use of IT for exploratory teaching, student-centred learning, assessments, and the teaching of social and ethical issues. In addition, opportunities for sharing and exchanging experiences, observing and reflecting on good practices, collaborating in curriculum and pedagogical innovations among the education community should be provided for teachers to enhance their understanding and experience in connection with effective use of IT for learning and teaching.

- **Enhancing School Leadership for the Knowledge Age:** To increase the effect of leadership work on the implementation of IT in school curriculum, it is suggested that an explicit ITEd plan should be made for the design of school ITEd curriculum by taking into consideration the curriculum aims and contents, the promotion of sharing culture, and the evaluation of school achievement. To evaluate the effectiveness of school ITEd plans, schools are recommended to conduct relevant school-based self-evaluations periodically with the use of the online survey platform “Self-evaluation Platform (SEP) on ITEd for Schools”.

- **Enriching Digital Resources for Learning:** To sustain the perpetual enrichment of quality digital educational resources for the needs of individual schools, financial support such as the “electronic Learning Credits” Scheme should be continuously provided for schools to develop a school-based digital resources repository in order to enhance and support learning and teaching.

- **Improving IT Infrastructure and Pioneering Pedagogy Using IT:** To promote the use of new technology in teaching as well as the innovative applications of IT among schools, opportunities for innovation and trials of new technologies and equipment that enhance learning and teaching should be provided by schools. In such situation, schools should make an explicit ITEd plan which outlines the requirements of IT infrastructure, the maintenance and replacement schedule for the computing facilities, and the design of ITEd curriculum and pedagogy.

- **Providing Continuous Research and Development:** To keep on investigating the impact of IT on students’ learning outcomes, it is recommended that the EMB should continue to initiate and commission research projects, at the school level, on the effect of innovative use of IT on students’ learning outcomes in terms of academic subject knowledge, higher-order thinking skills and generic competencies.

- **Promoting Community–wide Support and Community Building:** To elicit more support from parents for the implementation of the ITEd strategy, it is suggested that home-school collaboration through parents’ education programmes and communication should be strengthened to increase parents’ understanding of the value of information literacy and

parental support in promoting information literacy. To keep up the community-wide involvement in the implementation of the ITEd strategy, it is recommended that community-school collaboration activities for creating IT-embedded environment in school and reducing digital divide among students should be promoted.

報告摘要

研究目的

這項研究是香港特別行政區政府教育統籌局(教統局)委託進行的，目的是檢討在《善用資訊新科技　開拓教學新世紀》(第二個資訊科技教育策略) 文件發表以來，香港各項資訊科技教育措施的進展。這項研究的主要目的是：

i. 檢視學校、教師和學生有關應用資訊科技教育的實踐及社會各界的參與情況；
ii. 檢視由 2004/05 至 2006/07 學年各項資訊科技教育計劃的進度；及
iii. 就各項推行的計劃，提出適合的調整建議。

研究方法

本研究採用橫斷面式的研究設計，分兩個階段收集數據。第一及第二主要階段研究分別在 2005 年 10 月及 2006 年 10 月進行。第一主要階段研究所收集得到的數據爲本研究的基線數據，用以系統化檢視在第二個資訊科技教育策略第一階段中各項資訊科技教育措施或計劃的進度。第二主要階段研究所收集得到的橫斷面數據及後與第一主要階段研究的數據作出比較，用以追蹤由 2004/05 至 2006/07 學年間推行資訊科技教育的進度。

這項研究於兩個數據收集階段均同時採用「量性」和「質性」的研究方法收集數據。在收集「量性」數據方面，有關香港不同學校界別(即小學、中學及特殊學校)自 2004/05 學年起應用資訊科技的情況，以及在 2004/05 至 2006/07 學年期間推行資訊科技教育的進展，是經由各學校界別的校長和學校代表／資訊科技教育組組長／資訊科技統籌員，以及被選取學校的資訊科技教育組教師、教師 (包括特殊學校的治療師)、學生及家長填寫的不記名問卷調查收集得來。這包括八套爲不同持份者而設計的獨立問卷。本研究應用一個由教統局開發的網上系統，稱爲「學校資訊科技教育自評系統 (自評系統)[*]」，以進行不同學校界別持份者的網上問卷調查。至於家長及大部分特殊學校學生則使用印刷版本的問卷。

三個學校界別的所有學校均被邀請填寫校長資訊科技教育問卷調查和學校資訊科技教育調查（即全面調查），而其中被隨機抽樣的約 10% 至 15% 的學校，則會再進行其他持份者組別的問卷調查。參與第一及第二主要階段研究的不同學校界別的學校總數如下：

第一主要階段研究

- *全面調查*
  623 間小學(包括資助學校、直資學校及官立學校)、471 間中學(包括資助學校、按額津貼學校、直資學校及官立學校)，以及 61 間特殊學校 [特殊學校分六個類別：醫院學校 (H)、聽障兒童學校 (HI)、智障兒童學校 (ID)、肢體傷殘兒童學校 (PD)、群育學校 (SSD) 及視障兒童學校(VI)]
- *樣本學校*
  68 間小學、72 間中學及 10 間特殊學校

[*] 「自評系統」於 2006 年與「學校發展與問責」數據電子平台結合，詳情可參閱網址：http://www.emb.gov.hk/sep/eng (英文版) 或 http://www.emb.gov.hk/sep/chin (中文版)。

第二主要階段研究

- *全面調查*
  549 間小學、468 間中學及 60 間特殊學校
- *樣本學校*
  72 間小學、72 間中學及 10 間特殊學校

整體而言，大部分持份者組別的回應率都超過 70%。表 E.1 概括地列出第一及第二主要階段研究的不同持份者組別的整體回應率。

表 E.1　　第一及第二主要階段研究的不同持份者組別整體回應率概要

問卷類型	持份者組別	第一主要階段研究		第二主要階段研究	
		有回應的持份者總數	回應率	有回應的持份者總數	回應率
A. 全面調查					
1. 校長資訊科技教育問卷調查 (第一部份)	校長	1002	87%	851	79%
2. 校長資訊科技教育問卷調查 (第二部份)	校長	987	85%	843	78%
3. 學校資訊科技教育調查	學校代表/資訊科技教育組組長/資訊科技統籌員	992	86%	843	78%
B. 樣本學校					
4. 資訊科技教育組教師問卷調查	資訊科技教育組教師	713	83%	592	70%
5. 教師資訊科技教育問卷調查	教師	4748	70%	4053	57%
6. 治療師資訊科技教育問卷調查	治療師	25	83%	27	96%
7. 學生資訊科技教育問卷調查	學生	10143	81%	9375	74%
8. 家長資訊科技教育問卷調查	被選學生的家長	9501	76%	8214	65%

在收集「質性」數據方面，有關社區參與推行第二個資訊科技教育策略的資料是從社區組別透過焦點小組訪問搜集得來。在進行第一及第二主要階段研究數據收集的同時，合共進行了 9 次焦點小組訪問（包括 2 間與資訊科技相關組織、3 間非政府機構、2 間出版社及 2 間大專院校），收集社區組別被訪者就該等機構於推行香港資訊科技教育所訂定的目標及角色、相關工作、貢獻及建議等意見。

研究結果摘要

利用資訊科技加強學習者的能力

研究結果顯示中、小學生一般都具備資訊科技能力，能夠在不同掌握程度上應用不同類型的電腦軟件。然而，一般仍期望學生能加強學習基本技能，例如中文輸入法，特別在初小階段。在特殊學校就讀主流課程（Normal Curriculum, NC）** 的學生，在使用電腦軟件和硬件方面都表現出和中、小學生相似的掌握程度；惟就讀智障兒童學校(ID)學生的自評結果則顯示他們並不熟練。

小四至小六學生使用軟件進行溝通和搜尋資訊的掌握程度漸次增強，而中學生則保持平穩。研究結果亦顯示中二至中六學生應用資訊處理和分析軟件的掌握程度卻漸次下降。以上的現象可能是因爲小學加強專題研習活動，而高中課程則以考試爲主導而導致的結果。

**提供主流課程的特殊學校包括 H, HI, PD, SSD 及 VI

研究結果顯示學生對於與使用資訊科技有關的社會和道德操守議題有合理的關注程度。然而，中、小學生較少關注不當地發放或轉寄不必要的電子郵件或訊息；而中學生則甚至更少關注使用侵權軟件的問題。

接受調查的學生對使用資訊科技學習顯示正面的看法。學生認爲在學習上使用資訊科技最大的正面影響是能夠與外界有較多的互動而擴闊視野，提升他們自學學科內容的興趣，以及加強他們處理資訊的能力。相反地，中、小學生對於使用資訊科技可增強溝通和演示技巧則賦予最低的認同。

資訊科技課程的內容設計和教學法大體上適合學生的需要。研究結果顯示中、小學在預備學與教活動時能緊貼「資訊科技學習目標」(CDC, 2000)的指引，以發展學生使用資訊科技的能力。然而，研究結果也顯示現時的教學尚未能充份談及與使用資訊科技有關的社會及道德操守議題，故仍有改善的空間。

學生使用資訊科技進行的學習活動大致上頗爲豐富。研究顯示學生參與不同類型而又涉及使用資訊科技的學習活動，但這些活動性質大部分局限於資訊搜尋，而有關資訊選擇、資訊整理及分析、報告及演示，以及對學習成果的自我評估等活動數目則相對地少。然而，研究結果顯示以學生爲中心而又需要資訊搜尋等基本資訊素養技能的活動已經漸漸普及，這是可喜的現象；而這現象並沒有明顯地出現在以往的評估研究中。

利用資訊科技加強教師的教學能力

爲裝備教師使其具備將資訊科技融入於教學的能力及信心而推行的措施普遍是有效的。研究顯示大部分接受調查的教師能達到資訊科技能力的要求，他們均接受了良好的培訓，並能於教學上運用資訊科技。研究結果也顯示教師普遍有信心，並作好準備使用資訊科技結合高層次的學習活動。

研究發現三個學校界別中接受調查的教師經常使用資訊科技支援學科教學，如語文科，以及小學及特殊學校的常識科。一些接受調查的教師曾給學生指派作業，要求學生在家裏使用數碼資源學習學科內容。

爲教師提供有關資訊科技教育的專業發展機會而推行的措施是成功的。接受調查的教師表示現時的資訊科技教育專業發展課程及活動都很實用和大致足夠。他們相信這些課程和活動能加強他們掌握資訊科技的知識及技能，並提升他們運用資訊科技於學與教的能力。教師也表示未來的資訊科技教育專業發展課程或活動宜集中於在教學上應用新科技，以及在學科或跨課程教學上應用資訊科技。

配合知識年代提升學校領導能力

有關指導及支援校長及有關人員建構及實現把資訊科技融入學校環境的理想及目標的措施，普遍是奏效的。接受調查的校長對於學校的資訊科技教育計劃能達致學校基礎建設的要求感到滿意。然而，校長對於學校的資訊科技教育計劃涵蓋將資訊科技融入學與教，以及學校能嚴謹地評鑑資訊科技教育計劃的成效的內容及措施，則表示較低的滿意程度，但仍持有十分正面的態度。

有關支援校長及有關人員推動學校資訊科技文化的措施在一定程度上是有效的。研究顯示在學校間及教育界推動的資訊科技文化在某程度上於學校層面取得一定的成果。接受調查的小學及特殊學校校長對於學校持續推動教師團隊協作及互相分享在教學上使用資訊科技的經驗感到滿意，而中學校長則對這方面表示略低的滿意程度。

爲校長及有關人員提供彈性調撥校本資訊科技計劃的資源的措施，也能成功地推行。研究結果顯示，合併各類資訊科技津貼及容許彈性使用津貼的措施確實有效地提高學校爲支援校本資訊科技教育計劃而調撥資源的彈性。研究結果亦顯示學校除了獲取政府撥款外，也會運用各類資金，例如來自家長及其他機構的資源，用以支援校本資訊科技教育計劃。

豐富數碼學習資源

有關提供更切合個別學校需要的數碼學習資源的措施是具成效的。研究結果顯示，接受調查的校長、教師及學生都頗滿意學校提供的數碼資源。研究結果亦顯示，雖然在這研究期間已經開發了很多數碼資源，但仍然需求一些合適的數碼資源，以協助教授學科知識，及引導學生發展高層次思維技能和共通能力。

改善資訊科技基礎設施及利用資訊科技創新教學法

關於改善學校資訊科技基礎設施的措施是奏效的。研究結果指出教統局大規模投放資源和提供支援，讓學校的資訊科技基礎設施得以建立，並顯著改善。這些良好的資訊科技基建已隨時可應用於學與教上。現時，學生與電腦數目的比例已經與世界很多先進國家看齊，很多普通課室內更裝有數碼投影機。不同持份者組別對於學校有足夠的資訊科技設施及資訊科技設備與互聯網的連接均普遍表示滿意。研究結果亦顯示學校經已透過提升及更換陳舊的硬件以改善資訊科技基礎設施，並採用先進科技增強學校學與教的效能。

進行持續研究及發展

就研究資訊科技教育策略成效及資訊科技對學生學習成果的影響所進行的措施，大致上是成功的。教統局曾開展一些研究和探討工作，目的是整合及分享優秀案例，從而開創教學法；也委託一些相關的機構進行研究及發展計劃，以支援香港資訊科技教育的推行和持續發展。

有一項研究結果很令人感到鼓舞，一些學校已開始參與或開創一些先導計劃或方案，目的是探討使用資訊科技促進學與教的嶄新方法的成效。雖然現時開創有關資訊科技教育計劃的學校比率仍然較低，但研究發現學校與其他學校、本地大專院校、本地社區組織和本地商業機構進行協作先導計劃的現象十分普遍。

推動社區支援及社群建立

就實施學校資訊科技教育計劃方面，推動學校與家長合作的措施大致上是有成效的。研究顯示，家校協作和家長參與推動資訊科技教育兩方面都有所加強。對於爲家長而設有關資訊科技教育活動的發展，接受調查的家長認爲，現時的資訊科技教育活動頗爲足夠，而且他們對這些活動所達到的成果持頗正面的看法；同時，接受調查的家長亦關注兒童在使用資訊科技時所涉及的道德操守、法律和健康的議題。對於透過使用資訊科技以加強學校與家長的溝通這方面，研究結果顯示，使用電子渠道作此用途仍未普及。

鼓勵學校在教師培訓、數碼資源和其他相關範疇上加強與資訊科技業界伙伴合作的措施大致上是具成效的。社區內與資訊科技有關的組織，例如高等教育、私人及非政府界別內的組織，對資訊科技教育都有不同程度的貢獻，例如提供學生學習活動、教師培訓活動和數碼資源，以及進行研究計劃。研究發現，在有關教學上使用資訊科技的先導計劃或經驗分享活動方面，不少學校曾參與這些學校與社區的協作活動，情況令人鼓舞。

爲解決學生「數碼隔閡」問題而進行的措施已成功實施。研究顯示，就家庭擁有電腦的情況來看，「數碼隔閡」問題沒有以前顯著。接受調查的學生大致上都有家庭電腦可供使用。然而，對於低收入家庭組別的學生而言，他們較其他家庭收入組別的學生在家中使用資訊科技

及透過互聯網學習的機會仍然相對較低，這是由於他們家中沒有連接互聯網或網絡連線速度較慢。

主要建議

- **利用資訊科技加強學習者的能力：**爲讓學生獲得最新的資訊科技知識和掌握應用最新科技所需的技能，將資訊科技作爲一個獨立學科仍具其價值。事實上，這研究顯示差不多所有學校均已提供電腦／資訊科技科。然而，我們需要探討中、小學教育的資訊科技課程，以減少中、小學於有關學科重複的學習內容，使小學的電腦認知課程與中學的普通電腦科課程能順暢和緊密地銜接。

- **利用資訊科技加強教師的教學能力：**爲提升／保持教師在教學上善用資訊科技的能力和信心，研究小組建議應持續爲教師提供資訊科技教育專業發展的進修課程。未來的教師專業發展活動的方向應集中在使用資訊科技以進行探究教學、以學生爲中心的學習、評估和教授有關社會和道德操守的議題。此外，爲加深教師對有效使用資訊科技進行學與教方面的理解和體驗，亦應讓他們在教育社群內分享和交換經驗、觀察和反思優秀案例，以及協作課程和嶄新教學法。

- **配合知識年代提升學校領導能力：**爲提升在學校課程內推行資訊科技的領導工作的效能，研究小組建議學校應制定明確的資訊科技教育計劃，以便學校設計其資訊科技教育課程。在制定計劃時，學校可切實考慮課程目標和內容、分享文化的推廣，以及學校表現的評估。至於評估學校資訊科技教育計劃的成效方面，研究小組建議學校定期使用網上調查平台「學校資訊科技教育自評系統」以進行相關的校本自我評估工作。

- **豐富數碼學習資源：**爲持續不斷豐富優質的數碼學習資源以符合個別學校的需要，研究小組建議應繼續向學校提供財政上的支援，例如繼續推行「電子學習金」計劃，使學校發展校本數碼資源庫，從而提升和支援學與教。

- **改善資訊科技基礎設施及利用資訊科技創新教學法：**爲在學校間推廣使用新科技教學及創新的應用資訊科技的方法，學校應開創及試用有助提升學與教效能的新科技和設備。在這情況下，學校應制訂明確的資訊科技教育計劃，以概述對資訊科技基建的要求、電腦設施的維修保養和更換時間表，以及其資訊科技教育課程和教學法的構思。

- **進行持續研究及發展：**爲持續探究資訊科技對學生學習成果的影響，研究小組建議教統局應繼續展開及委託進行研究計劃，並在學校層面上探討創新使用資訊科技對學生在學科知識、高層次思維技能，以及共通能力方面的學習成果所帶來的影響。

- **推動社區支援及社群建立：**爲得到家長更多的支持從而推行資訊科技教育策略，研究小組建議應透過家長教育計劃和溝通工作加強家校協作，使家長對資訊素養有更深入的了解，以及獲得更多家長支持推廣資訊素養。爲使社區各界更積極參與推行資訊科技教育策略，研究小組建議應推廣社區與學校的協作活動，以建立資訊科技融入學校的學習環境，及減少學生之間的「數碼隔閡」。

Chapter 1 Background of the Study

1.1 Introduction

In the twenty-first century, the strategy of promoting Information Technology in Education (ITEd) is motivated by three developments in society: the new knowledge society, the growing popularity of digital culture and the globalisation of the world economy. Since the growth of the Internet in the 1990s, information has readily been accessible for every subject. The acquisition of requisite skills to process and apply information for problem-solving has become an important part of integrating Information Technology (IT)[1] in school education. Such skills are highly related to how to find and use resources for learning in a mass education context.

In order to equip our younger generation to face the challenge of an increasingly knowledge-based and competitive world of tomorrow, the Education and Manpower Bureau (EMB) of the Government of Hong Kong Special Administrative Region of the People's Republic of China (Hong Kong SAR Government) has placed significant investment in ITEd. At present, the basic IT infrastructure for all primary and secondary schools have been established in Hong Kong since the launch of *Information Technology for Learning in a New Era: Five-Year Strategy – 1998/99 to 2002/03* (EMB, 1998) (the Five-Year Strategy). Most of the primary and secondary schools have put into practice the guidelines suggested in the *Information Technology Learning Targets* [Curriculum Development Council (CDC), 2000] via their school-based IT curriculum. These two achievements reflect that schools have laid down a solid foundation for further integration of ITEd. This statement echoes with the findings from the report of the *Overall Study on Reviewing the Progress and Evaluating the Information Technology in Education (ITEd) Projects 1998/2003* (EMB, 2005b) (Overall Study). Up-to-date and high performance infrastructure has been installed in most of the schools. All teaching staff have been trained on the use of IT in learning and teaching. However, the report also affirms that the use of technology in actual classroom is still related more to teacher-centred than student-centred learning, involving predominantly didactic expository teaching such as explanation and demonstration. There is relatively less opportunity for individual interaction with computers and even less for collaborative interaction which focuses on facilitating learning and assessment or for tasks requiring higher-order thinking skills (EMB, 2005b). Building on such findings, the report further suggests ways to guide the strategic development of ITEd in Hong Kong. These suggestions are incorporated into the policy document, *Empowering Learning and Teaching with Information Technology* (EMB, 2004), published in July 2004 by the EMB as appropriate. The document set out seven strategic goals and respective measures with the vision of using "IT effectively as a tool for enhancing the effectiveness of learning and teaching, with a view to preparing our students for the information age, turning schools into dynamic and interactive learning institutions, and fostering collaboration among schools, parents and the community".

As the Government has placed significant investment in the promotion of ITEd, it is important to allow the public to have an idea of how effective various ITEd initiatives on learning have been. Hence, one of the major strategic goals of the above policy document is to research on the effectiveness of the use of ITEd strategy and the impact of IT on students' learning outcomes (Goal 6: Providing Continuous Research and Development) (EMB, 2004). It is also worth establishing a mechanism for tracking the progress of various strategic measures taken place in the community in order to achieve a better understanding of the effectiveness of various

[1] The term 'Information Technology' (IT) is used in this report to align with that used by the Education and Manpower Bureau in Hong Kong. It is synonymous to the term 'Information and Communication Technology' (ICT) commonly used in western countries.

implementation measures under respective strategic goals. In this respect, the EMB of the Hong Kong SAR Government commissioned the Hong Kong Institute of Education (HKIEd) to conduct *Phase (I) Study on Evaluating the Effectiveness of the 'Empowering Learning and Teaching with Information Technology' Strategy (2004/2007)* (Second ITEd Strategy) for systematic review of the progress of various ITEd initiatives or projects and timely recommendations on the way forward for ITEd. The findings collected will be used by *Phase (II) Study on Evaluating the Effectiveness of the 'Empowering Learning and Teaching with Information Technology' Strategy (2004/2007)*[2] as appropriate. Moreover, this Study has established a mechanism to track the progress of various ITEd initiatives or projects and retrieve useful information from the school, student and community levels with a well-defined knowledge management model for upkeeping and analysing relevant data for subsequent continuous evaluation to inform future policies.

1.2 Scope and Objective of the Study

The main objectives of the Study are:

a. to review the application of ITEd as related to school, teacher and student practices as well as the involvement of the community sector in ITEd;
b. to review the progress of the ITEd projects as from 2004/05 to 2006/07 school years; and
c. to recommend necessary adjustments to the implementation of relevant projects as appropriate.

Given the above main objectives, the scope of this Study is as follows:

a. to draw up a set of indicators for evaluating the effectiveness of the Second ITEd Strategy with respect to each of the following seven strategic goals -
    - Empowering learners with IT;
    - Empowering teachers with IT;
    - Enhancing school leadership for the knowledge age;
    - Enriching digital resources for learning;
    - Improving IT infrastructure and pioneering pedagogy using IT;
    - Providing continuous research and development; and
    - Promoting community-wide support and community building;
b. to develop instruments with respect to the target stakeholder groups [including school heads, ITEd Team members, teachers, students and parents of primary, secondary and special schools as well as the Community Group such as tertiary institutions, publishers, IT-related organisations and non-governmental organisations (NGOs)] based on the set of indicators identified in (a) for cross-sectional data collection to be conducted at 2 intervals, i.e. October 2005 and October 2006;

[2] Phase (II) Study on Evaluating the Effectiveness of the 'Empowering Learning and Teaching with Information Technology' Strategy (2004/2007) aims at evaluating the impact of IT on empowering students' learning in selected key learning areas and drawing on the results of Phase (I) Study to conclude the overall effectiveness of the Strategy as well as to recommend the way forward beyond 2006/07 school years.

c. to devise representative and statistically significant sample schemes of target stakeholders in each type of schools (i.e. primary, secondary and special) as well as other community groups and organisations and to conduct -
    - a pilot test prior to the data collection as mentioned in (b) to test the instruments designed as well as to refine (a) and (b) above; and
    - two cross-sectional studies in October 2005 and October 2006 in accordance with (a), (b) and any necessary refinements on the instruments and logistics for the second data collection;
d. to establish a mechanism to collect the requisite data on a continual basis in respect of the seven goals of the Second ITEd Strategy and to classify such data into a data bank based on a knowledge management model; and
e. to recommend necessary adjustments to the implementation of the ITEd projects as appropriate.

Chapter 2 Literature Review

This chapter gives an overview of the impact of ITEd. The evaluation frameworks and standards, as well as the areas of concern in the implementation of ITEd are presented. The strategic goals stipulated in the Second ITEd Strategy and various ITEd initiatives or projects implemented by the Government from 2004/05 to 2006/07 school years are also summarised.

2.1 Impact of Information Technology (IT) in Education

The advancement of IT has made great impact on the education community. This section attempts to provide an overview of such impact that underpins the application and government investment in ITEd in the education sector. The following review is based on the resource-based learning environment (RBLE) and systemic change theories.

Knowledge construction entails a process of inquiry in which students are engaged in searching, comprehending, organising, synthesizing and evaluating information. In this respect, students should be facilitated to find, use and evaluate information in a resource-rich environment. Learning is not a passive information reception process but "an active, constructive process whereby the learner strategically manages the available resources to create new knowledge by extracting information from the environment and integrating it with information already stored in memory" (Kozma, 1991, p.179). Apart from using resources to supplement teacher's instruction and to act as a vehicle to deliver information to a learner (Clark, 1983), there are the shifting roles of teachers and learners (Haycock, 1991). Learners should be given the opportunity to learn individually or in a group with activities connected with them in a resource area such as a classroom, a laboratory, or a library inside and outside schools (Beswick, 1977). Such an approach changes the role of resources from a passive to a more active role that enables students to access and choose resources for the purpose of assisting knowledge construction (Farmer, 1999). Understanding is seen to evolve through exploration and inquiry in a RBLE by means of active collaboration with rich databases, tools, and resources (Jonassen, Campbell & Davidson, 1994; Jonassen, 1996a, 1996b; Land & Hannafin, 1996; Hannafin, Hill & Land, 1997; Kozma, 1991). A shift of using resources or instructional media from the view of "learning from media" to a more constructivist view of "learning *with* media" in a RBLE is necessary (Jonassen et al., 1994). Thus, a constructivist-based RBLE will be "a place where learners may work together and support each other as they use a variety of tools and information resources in their pursuit of learning goals and problem solving activities" (Wilson, 1995, p.27). Hence, creating a constructivist-based RBLE for students should be the direction of integrating IT in school education. The notion of resource-based learning then offers an appropriate conceptual framework to evaluate the impact of IT on constructivist learning.

Furthermore, given that learners are able to access different types of media in a RBLE, the resource-based approach can cater for the different needs of individuals who come into learning with different learning styles and processing skills (Farmer, 1999). Apart from knowledge construction, problem-solving skills are enhanced through the use of available resources and tools in a constructivist-based learning environment (Edwards, 1995; Doiron & Davis, 1998). When computer resources are used in a RBLE, the use of such resources promotes collaborative roles for both peers and teachers (Means & Olson, 1997). There are also other reports that provide evidence for an increase in motivation and changes in attitude towards learning when computer resources are employed (see, e.g., Boyd, 1997; Watson, 1993). Teachers are also reported to emphasize on the development of creativity and higher-order thinking in student-centred activities when such technologies are used (Liu, Macmillan & Timmons, 1998; Pedretti, Mayer-Smith & Woodrow, 1998; Rodrigues, 1997; MacGregor & Lou 2004).

Teachers may change their attitude towards computers and increase the use of computers in teaching (Boyd, 1997; Sheingold & Hadley, 1990; Wenglinsky, 1998). When teachers are confident about using teaching technologies in their classroom, the structure of their teaching changes (Knupfer, 1991). A number of common teaching characteristics are identified when teachers use technology in their teaching for an extended period of time (Knapp & Glenn, 1996):

> teachers using technology in their teaching usually expect more from their students and expect their students to take more care in preparing their work; can present more complex materials; believe students understand more difficult concepts; can meet the needs of individual students better, can be more open to multiple perspectives on problems; are more willing to experiment; feel more professional because, among other things, they spend less time in dispensing information and more time helping students learn. (p.17)

Researchers have interpreted the above findings as evidence for systemic changes brought about by the use of technologies in education (e.g., Liu et al., 1998). Such a view represents a total "system change" in the teaching and learning processes that involve not only knowledge construction but include the influence of technology on people, teaching and learning processes and also further development and use of resources. In the study of the "Apple Classroom of Tomorrow (ACOT)" project (Dwyer, 1994, p.4): "after nearly eight years of studying the computer's effects on classroom, ACOT researchers have observed profound changes in the nature of instruction, learning, assessment and the school culture itself". The changes include positive attitude of teachers about the infusion of technology in teaching and learning (Sandholtz, Ringstaff & Dwyer, 1997).

Over the past two decades, despite the positive impact of IT on education as stated above, other international researches on the impact of IT on students' learning outcomes have not produced unequivocal evidence that the use of IT in school learning environments improves learning outcomes for students. Many educators have been particularly concerned that very little of the potential of computers to support learning in schools seems to have been realised, despite a high degree of improvement in infrastructure support. Numerous studies also have shown that few teachers facilitate students' use of computers substantially (Becker, Ravitz & Wong, 1999; DeCorte, 1990; Plomp & Pelgrum, 1992). The majority of teachers, although possibly keen to initiate technology-related projects to integrate technology into their daily work, are still using IT in a very teacher-centred way. Thus, in view of the more widespread funding and extended use of IT and the greater ease of accessibility, "teachers have to seriously think about how IT might support or alter their approaches to teaching strategies" (Loveless, DeVoogd & Bohlin, 2001a, p.68; Loveless & Ellis, 2001b).

In understanding how IT supports learning, there is a continuous challenge to "get underneath" statistics to understand better the processes, factors and specific uses of IT which consistently relate to positive impact on pupils' learning and institutional standards, and to understand which of these add most value [British Educational Communications and Technology Agency (Becta), 2005, p.39]. This represents a major evidence of challenge. In the context of continually developing educational thinking and innovation in IT provision and use, any study should aim to ensure that teachers can be re-oriented towards developing a more supplicated and complex understanding of IT, not only as technology in education but as a social phenomenon shaped by multi-factors, often in non-linear ways, and interpreted differently by different learners. In this regard, many studies have developed evaluation frameworks and standards to determine the impact of the use of IT on education. The following section will review these studies from which some common areas of concern are defined for the evaluation of ITEd in this Study.

2.2 Some Common Areas of Concern for the Evaluation of IT in Education (ITEd)

In order to define the areas of concern to evaluate the progress of the implementation of ITEd, some of the frameworks and standards used for evaluating outcomes of ITEd are summarised in this section. The common areas of concern for the evaluation of ITEd in this Study will then be distilled and further reviewed from the literature.

Frameworks and Standards

Three evaluation frameworks which have been applied to guide the ITEd in America (US), Australia and England (UK) respectively are summarized below:

"Seven Dimensions for Gauging Progress" is a framework focused on bringing up the learning levels of students through technology in US (Lemke & Coughlin, 1998). The framework comprises seven interdependent dimensions:

- Learners (fluency, strengthening the basics and developing higher level skills, increasing relevancy, motivation to learn and recognition of tradeoffs);
- Learning environments (learning context, learning content, school culture, technology access, information and communication);
- Professional competency (core technology fluency, curriculum, learning and assessment, professional practice and collegiality, classroom and instructional management);
- System capacity (vision, leadership and planning, ensuring capacity and systems thinking);
- Community connections (commitment, collaboration, clarity and communication);
- Technology capacity (installed base, connectivity, technical support, client orientation and facilities);
- Accountability (deliverables and benchmarks, data collection/interim progress, data-driven decision making and communication).

"A Framework to Articulate the Impact of ICT on Learning in Schools" is developed to track the progress of ITEd in Australia (Newhouse, 2002b). Five dimensions are identified:

- Students (ICT capability, engagement and achievement of learning outcomes);
- Learning environments attributes (learner-centred, knowledge-centred, assessment-centred and community-centred);
- Teacher professional ICT attributes (vision and contribution, integration and use as well as capabilities and feelings);
- School ICT capacity (hardware, connectivity, software, technical support and digital resource materials);
- School environment (leadership and planning, curriculum organisation, curriculum support, community connections and accountability).

"The Common Evaluation Framework – Measuring the impact of whole-school ICT" (DEPICTS, 2004), which is developed in UK, designates seven evaluation strands. They are:

- Leadership and vision;
- Curriculum;
- Teaching and learning;
- Assessment;
- Continuing professional development;
- Resources; and
- Pupil outcomes.

Furthermore, the standards for the educational use of technology, which are developed in US, provide deeper insight on ITEd in terms of the stakeholders: school leaders, teachers and students. The International Society for Technology in Education (ISTE) has identified the educational technology standards for teachers (ISTE, 1998a and 2002), the technology foundation standards for students (ISTE, 1998b) and the technology standards for school administrators [Collaborative for Technology Standards for School Administrators (CTSSA), 2001].

The six areas of educational technology standards for teachers are:

- Technology operations and concepts;
- Planning and designing learning environments and experiences;
- Teaching, learning and the curriculum;
- Assessment and evaluation;
- Productivity and professional practice; as well as
- Social, ethical, legal and human issues.

The six categories of technology foundation standards for students are:

- Basic operations and concepts;
- Social, ethical, and human issues;
- Technology productivity tools;
- Technology communications tools;
- Technology research tools; as well as
- Technology problem-solving and decision-making tools.

The six areas of technology standards for school administrators are:

- Leadership and vision;
- Learning and teaching;
- Productivity and professional practice;
- Support, management and operations;
- Assessment and evaluation; as well as
- Social, legal and ethical issues.

From the above frameworks and standards, some common areas of concern for the evaluation on the implementation of ITEd are observed. Then, an attempt is made to distill the evaluative areas from these areas of concern for this Study. A structural framework with an emphasis on four dimensions of input, context, process and outcome is proposed [derived from Stufflebeam's Context, Input, Process, Product (CIPP) evaluation model (Stufflebeam, 2000)]. Table 2.1 summarises and compares the areas of concern in this Study and the three frameworks stated above.

Table 2.1 Comparisons of the areas of concern for the evaluation of ITEd in this Study with other literatures

Areas of concern for the evaluation of ITEd in this Study			**Framework for US** (Lemke & Coughlin, 1998)	**Framework for Australia** (Newhouse, 2002b)	**Framework for UK** (DEPICTS, 2004)
Input dimension	1	Students' Perception of Learning with IT	Learners' Dimension	Students' Dimension (Students' ICT Competencies, Technology Literacy subsumed in Learning Environment Dimension)	
	2	Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd	Professional Competency Dimension	Teachers' ICT Attributes Dimension	Strand: Teaching and Learning
	3	Community-wide Support & Parents' Involvement	Community Connections Dimension	School Environment Dimension	Strand: Resources
Context dimension	4	School ITEd Curriculum	School Curriculum Dimension	School Environment Dimension	Strand: Curriculum
	5	School Professional Development in ITEd	System Capacity Dimension	Teachers' ICT Attributes Dimension	Strand: Professional Development
	6	School Leadership	System Capacity Dimension	School Environment Dimension	Strand: Leadership and Vision
	7	Digital Resources & Infrastructure	Technology Capacity Dimension	School ICT Capacity Dimension	Strand: Resources
	8	School Technology-using Culture and ITEd Development	Technology Capacity Dimension	School ICT Capacity Dimension	Strand: Resources
Process dimension	9	Students' Learning Activities with IT	Learners' Dimension	School Environment Dimension	Strand: Teaching and Learning & Assessment
	10	Teachers' Pedagogical Practices with IT	Learners' Dimension	School Environment Dimension	Strand: Teaching and Learning
Outcome dimension	11	Students' Learning Outcomes in Different Key Learning Areas (KLAs) and the Development of Information Literacy and Generic Skills	Accountability Dimension	Students' Learning, the Impact of ICT in Schools	Strand: Standards

A further review in the following gives more specific details on each of the area concerned in the four dimensions identified in this Study.

The Input Dimension

The input dimension of ITEd includes three areas:

- Students' perception of learning with IT;
- Teachers' IT competence as well as teachers' and school heads' perception of ITEd; and
- Community-wide support and parents' involvement.

Students' perception of learning with IT

Perception towards IT influences students' learning motivation. The willingness and acceptance of the use of IT in learning is a psychological input to students towards learning with IT. Educational technology has had positive effects on students' attitude towards learning and self-concept (Roschelle, Pea, Hoadley, Gordin & Means, 2000; Sivin-Kachala & Bialo, 1996). Many studies have found that students who like to use computers are more likely to develop more positive attitude towards learning themselves (Réginald, Bracewell & Laferriére, 1996; Schacter, 1999; Fisher & Stolarchuk, 1998; HKIEd, 1999). However, the negative perception or attitude of the students should not be ignored. Some students have expressed their views that their learning is not completed if they only have virtual learning spaces without face-to-face interaction (Dede, L'Bahy & Whitehouse, 2002).

Teachers' IT competence as well as teachers' and school heads' perception of ITEd

Teachers' IT competence, belief and attitude as well as school heads' IT perception are crucial in ITEd. Teachers' attitude towards technology, which shapes the content selection, delivery methods, interaction styles and assessment techniques that drive curricula and instruction on a daily basis (Albion & Ertmer, 2002; Pajares, 1992), is one of the most critical variables in predicting technology use (Ravitz, Wong & Becker, 1999). Teachers' IT confidence and competence then influences their plans for integrating technology into classroom practices (Topper, 2004). With positive belief and attitude towards the use of ITEd, school heads initiate the supportive environment (Staples, Pugach & Himes, 2005), which is important for teachers to apply IT in learning and teaching.

Community-wide support and parents' involvement

Students' learning environment with IT is enriched by the community-wide support and parental support. Studies have confirmed that knowledge construction is a community activity where learning is enhanced through contact with the wider community (Committee on Developments in the Science of Learning, 2000, p.224; Riel, 1998). This means that schools need to involve more heterogeneous groupings, community organisation, collaboration, interdependent teamwork, and to allow input from a range of expertise. Learning and building knowledge is viewed increasingly as a community activity where schools in the past have tended to be isolated from the community (Riel, 1998). Researches also show that the most accurate predictor of a student's achievement in school is the extent to which that student's family is able to create a home environment that encourages learning, express high expectations for their children's achievement and future careers and become involved in their children's education at school and in the community (Henderson & Mapp, 2002). Community is also one of the important factors helping to bridge the digital divide, such as increasing computers and Internet access points for low-income group at community-based centers and public libraries (U.S. Department of Commerce, 1999; Light, 2001; Ba, Tally & Tsikalas, 2002; EMB, 2004).

The Context Dimension

The context dimension refers to the IT learning environment. Five areas are included in this dimension:

- School ITEd curriculum;
- Digital resources and infrastructure;
- School technology-using culture and ITEd development;
- School professional development in ITEd; and
- School leadership.

School ITEd curriculum

The school ITEd curriculum forms the blueprint for the contexts of ITEd. The importance of technology in the school curriculum has been strongly advocated (Vohra, 1987). The school-based curriculum development concerns both the practical level and perceptual level (Chen & Chung, 2000). Therefore, a clear IT vision and perception which directs the school curriculum change is essential (Treagust & Rennie, 1993). It provides the critical scaffold for integrating technology (Staples et al., 2005). Incorporation of technology within the school curriculum takes into account the factors with regard to the course content, teaching method, funding arrangement of hardware and software requirements, coordinator and teaching staff support, as well as guiding direction, keeping progress and evaluation (Treagust & Rennie, 1993).

Digital resources and infrastructure

Technology provides the scaffold, tools and act as affordances of the learning process in an IT learning environment. There is a need to consider the affordances of the whole learning environment, which include digital resources, teachers and students (Webb & Cox, 2004). At the representation stage in the pedagogical reasoning process, teachers need to decide what resources and approaches are likely to enable students to develop the particular skills and concepts in which they are teaching. They also need to be able to identify affordances in any suitable software and other resources for exploring and developing the ideas and skills that are to be taught (see also Kozma, 2003). They then need to build these into lesson plans that involve activities in which they and the students also play their roles in providing affordances.

School technology-using culture and ITEd development

Culture can be a principal basis for resistance to change (Schein, 1997). The introduction of technology can cause disruption to the existing school culture for students, teachers, and parents which often result in failure of implementation of IT (Zhao, Pugh, Sheldon & Byers, 2002). The school culture of incorporating technology should be established. Nurturing the culture of sharing good practices and systematic collaboration among teachers and schools is critical to the success in ITEd development (Louis, Kruse & Raywid, 1996; DuFour & Berkey, 1995).

School professional development in ITEd

Studies have found that teachers have to develop the capacity to take full advantage of new technologies that enable them to enhance the learning of their students from professional development programmes **(**Adelsberger, Collis & Pawlowski, 2002; Bennett, McMillan-Culp, Honey, Tally & Spielvogel, 2000; Bowman, Newman & Masterson, 2001; Levine, 2002; Morrison & Lowther, 2002; Thornburg, 1998; Valdez et al., 2000; Wetzel, Zambo & Padgett, 2001). These programmes should emphasize the importance of linking technology with school curricula in the professional development of teachers, rather than simply delivering technical training (CEO forum on Education and Technology, 1999; EMB, 2005b). Barnett (2003) provides a useful list of strategies to enhance teachers' use of IT, including getting input from principals, grouping teachers by grade level or subject, focusing content on curriculum rather than software, and modeling classroom examples. Moreover, teachers' feeling of preparedness to support students' technology use, teachers' perceptions of the relevance of pedagogical approaches and usefulness

of creating technology-based projects with students will contribute positively to the technology-focused professional development programmes (Kanaya, Light & Culp, 2005). Action research, intensive training, on-site support, collaborative learning projects, mentoring and networking are suggested as the types of professional development (Laferrière, Breuleux & Bracewell, 1999).

School leadership

School heads are able to give prominence to resource-based learning by ensuring that it is properly coordinated within school and should be incorporated into the curriculum and long-term plan of the school. The organisational capacity of a school which determines its ability to accept and commit to change, is enhanced by school-wide teacher professional communities that will affect the use of classroom pedagogy and in turn affect student performance (Newman & Weylage, 1995). Good IT leadership includes clear educational principles to inform IT developments and an ethos that encourages innovation and risk-taking [Becta, 2005; Office for Standards in Education (Ofsted), 2004)]. This leadership contributes to a supportive environment and school culture that have a positive impact on teachers' attitude and behaviour [Becta, 2002; Somekh et al., 2002; Yee, 2000; Telem, 2001; Organisation for Economic Co-operation and Development (OECD), 2001; Evans, 2002].

The Process Dimension

The process dimension refers to the teaching and learning processes. This dimension includes:

- Students' learning activities with IT; and
- Teachers' pedagogical practices with IT.

Students' learning activities with IT

From a constructivist view of learning, effective learning situations are those in which the learner is immersed in the resolution of a problem where the learner's skills in informal reasoning, self-questioning, reflection and argumentation can be applied and developed (Jonassen, 1997; Jonassen, Howland, Moore & Marra, 2003). Therefore, the learning activities should emphasize learners' ability to solve real-life and practical problems. This involves identifying issues, researching the problem, planning the investigation and choosing a solution. It is argued that this kind of learning can be supported through the development of technology-supported learning environments (Jonassen, 1997 and 2000; Scott & Hannafin, 2000).

Teachers' pedagogical practices with IT

With respect to the pedagogical application of IT, various digital tools such as assessment tools are emerged to support learner-centered mode of learning and outcome-based curriculum (Newhouse, 2002a, p.19). The incorporation of technology as a learning tool in the classroom enhances actual student learning, in terms of providing learning opportunities and moderating individual differences (Lee, Lam & Li, 2004; Krentler & Willis-Flurry, 2005). With the use of IT, teachers are encouraged to assess students' achievement through self-evaluation, teachers' reflection and interaction between students and teachers (Williams, Hricko & Howell, 2006). This requires the collection, storage, and organisation of a large quantity and range of types of data that is realistically only possible with the support from IT (Lee et al., 2004; Reeves & Hedberg, 2003).

The Outcome Dimension

Students' learning outcomes

Students' learning outcomes are redefined with the increased importance on the use of IT. Information literacy becomes an expected learning outcome as a result of the increased importance on the use of IT (Leach, 2005). Information literacy, not only encompasses a mastery of basic computer skills and an ability to use the most common applications, but also requires intellectual abilities such as "abstract thinking", "sustained reasoning" and "managing complexity" (Brandt, 2001; National Research Council, 1999; Talja, 2005). As there is an enormous volume of information provided in the World Wide Web, it is important to empower learners to be creative, critical and constructive users in determining the quality, importance and reliability of information, that is, information-processing skills (Burbules, 1997; Bereiter, 1998; Todd, 1998; Wheeler, Waite & Bromfield, 2002). The most significant outcomes of innovative learning activities involving IT are not only cognitive learning outcomes (Mioduser, Nachmias, Tubin & Forkosh-Baruch, 2002) but also affective and socio-cognitive learning outcomes that are important to the preparation for lifelong learning (Law, Lee & Chow, 2002). More important skills for students are higher-order thinking skills and generic technology skills such as communication and teamwork, which should be promoted through learning with IT across the curriculum (McGettrick & Mansor, 1999; Wenglinsky, 2005). Understanding and development of correct attitude towards the social, legal and ethical issues induced from the use of IT are other learning outcomes for students to attain (ISTE, 1998b).

2.3 The Second ITEd Strategy

This section describes the seven strategic goals and the respective initiatives and measures undertaken by the Government during the period of the Second ITEd Strategy from 2004/05 to 2006/07 school years. The description is summarised from the strategic policy document *Empowering Learning and Teaching with Information Technology* (EMB, 2004) and documents related to the ITEd initiatives provided by the EMB.

The seven strategic goals are:

- Empowering learners with IT;
- Empowering teachers with IT;
- Enhancing school leadership for the knowledge age;
- Enriching digital resources for learning;
- Improving IT infrastructure and pioneering pedagogy using IT;
- Providing continuous research and development; and
- Promoting community-wide support and community building.

Empowering Learners with IT

The first strategic goal of the ITEd Strategy is "Empowering learners with IT". It aims at equipping students with "the necessary skills, knowledge and attitude for lifelong learning and creative problem solving in the information age". Students are encouraged to use IT as an "information retrieval, knowledge enquiry, communication, collaboration, analytical and personal development tool".

Over the period of the Second ITEd Strategy, an extensive amount of input and support has been given by the EMB to promote the use of IT in learning among students and cultivate students' global perspective. The plan includes setting clear learning targets in curriculum, developing assessment tools that are fully integrated with an IT-enriched pedagogy and providing e-learning platforms for students. "An information literacy (IL) framework" was developed by the EMB for

Hong Kong's primary school and secondary school students to help teachers and students have a clearer picture on the learning targets of using ITEd (EMB, 2005a). Consultation sessions for school heads and teachers on implementing this framework, introducing the proposed IL standards, indicators and learning outcomes, exemplars of implementing IL education in school and teacher professional development programmes, were held in 2005.

Empowering Teachers with IT

The second strategic goal is "Empowering teachers with IT". The purpose is to enable teachers to make good pedagogical use of IT as a tool to stimulate students' thinking or facilitate students to construct their own knowledge.

In order to ensure that teachers are competent and confident to meet the challenges of using IT for curriculum and pedagogical innovations, professional development opportunities and support have been offered by the EMB. It is envisaged that the professional development activities can help teachers to facilitate exploratory learning, guide collaborative enquiries, provide learning resources, administer learning tasks, tailor-made teaching to students' varied abilities and conduct assessments. Various profession-related training courses, seminars and workshops, such as "IT in Education Symposium 2004", "Hong Kong International IT in Education Conference 2006", "IT in Education Symposium 2007", ITEd refresher training courses, ITEd workshops and experience sharing sessions were organised. The focus of the training courses switched from IT skills to pedagogical innovations to support Key Learning Areas (KLAs) or subjects. Through these professional development programmes, teachers have gained precious knowledge and skills on ITEd-related aspects that effectively uplifted their professionalism. Moreover, the "train-the-trainers" scheme was enhanced. The "train-the-trainers" courses were targeted to prepare teachers to take up the role as trainers in subsequent teacher training courses. The EMB also encouraged sharing and collaboration among teachers and schools. The "Good Practices on IT in Education" interactive platform was formally launched in February 2006. This platform was not only a database of pedagogical innovations using IT but also an interactive platform for discussion and reflection among teachers and other education practitioners. It aimed at establishing a learning community for professional collaboration.

Enhancing School Leadership for the Knowledge Age

The third strategic goal is "Enhancing school leadership for the knowledge age". The objective is to equip school heads with leadership capacities so that they can provide teachers with guidance and support to establish schools' IT culture. IT leadership training has been organised and sharing platform has been established in order to allow school heads to explore efficient ways of utilizing resources, enhancing teacher training and promoting students' learning with IT. Various professional development programmes, seminars and workshops, such as "Empowering Learning and Teaching with Information Technology – Briefing Seminar and Exhibition" and "Seminar on implementing an information literacy framework for Hong Kong students (Primary/Secondary)" were organised to help school heads and their associates to understand the different dimensions of school policy and strategy (including IT infrastructure, curriculum goals for IT use, staffing policy, staff appraisal and reward policy) that affected the implementation of IT in the school curriculum. e-Leadership training courses were piloted for school principals to build knowledge, skills and understanding of key issues and impact of learning and teaching with IT.

The provisions of flexibility in resources allocation as well as pedagogical and technical support provided by the EMB enabled school heads to lead change in curriculum innovation and school strategic development based on their own needs. The EMB disseminated assessment tools via the Self-evaluation Platform (SEP) on ITEd for Schools. SEP was a web-based platform for individual schools to conduct self-evaluation of their performance and progress in ITEd. Schools could use or

adapt the sample surveys disseminated through the system or create school-based surveys in accordance with the evaluation goals or targets set out in their ITEd plans.

The EMB continued with the disbursement of IT grants to schools. Various IT grants such as the grants for employment of technical staff and support services, purchase of Internet services and IT-related consumables, and organising IT activities for parents were provided to schools. Schools were given the flexibility to allocate resources to support their school-based ITEd plans. Schools were also encouraged to seek funding support from parents and other parties to support school-based ITEd initiatives.

A list of ITEd-related grants is shown as follows:

- Special Non-recurrent Grant for Parental IT Programmes for 2005/06 and 2006/07 school years;
- Funding for the Enhancement of IT Facilities/Services in Schools;
- Composite Information Technology Grant; and
- e-Learning Credits.

The schools could also deploy resources for the development of ITEd from other funding sources.

Enriching Digital Resources for Learning

The fourth strategic goal is "Enriching digital resources for learning". This goal aims at continually enriching quality digital educational resources to meet schools' needs. It also aims at developing the digital resource repository with effective knowledge management strategies to facilitate learning, teaching and sharing among teachers, parents, students and other schools. Digital resources were enriched by the EMB, tertiary institutions, the private sector, schools and teachers. The EMB produced a variety of digital educational resources to facilitate KLA and subject-learning as well as develop students' higher-order thinking skills. The EMB also launched the incentive scheme for developing instructional software to encourage participation and investment from various stakeholders in developing quality digital resources.–

In order to assemble various digital resources from different sources, an efficient management mechanism is needed. The Hong Kong Education City (HKEdCity at www.hkedcity.net), thus was launched by the EMB as an online digital resources repository to support learning and teaching. It served to provide quality digital resources for teachers, students, schools and the community. The role of the HKEdCity was strengthened as "an agent for sourcing, editing and disseminating digital educational resources". Such repository is evaluated continuously to improve the quality of digital resources and to suit the needs for the users.

Various professional development programmes in relation to the promotion on the use of digital resources were organised by the EMB. For instance, "Showcase of Learning & Teaching Digital Resources", which aimed at introducing the projects of the Incentive Scheme for developing instructional software and other digital resource materials jointly developed with the HKEdCity, was held in June 2006.

Moreover, the "electronic Learning Credits" scheme was also provided to schools for acquiring relevant electronic and interactive learning materials as well as curriculum-specific computer peripherals.

Regarding copyright matters concerning schools, seminars which addressed the intellectual property issues about the use of web-based teaching resources and self-made digital learning and teaching materials for sharing were arranged by the EMB in January 2005. More seminars on new licence agreement on copying printed copyright materials and software licensing for schools were

organised by the EMB in May 2006. These seminars aimed at updating schools on the latest development of copyright matters in education and introducing the Software Asset Management (SAM) tools.

Improving IT Infrastructure and Pioneering Pedagogy Using IT

The fifth strategic goal of the Second ITEd Strategy is "Improving IT infrastructure and pioneering pedagogy using IT". The progress of IT infrastructure improvement is tracked in terms of the sufficiency of serviceable IT facilities and technical support for students and teachers, as well as the new technology to support innovative pedagogy in learning and teaching enhancement.

The EMB extended various funding on a matching basis to help schools to upgrade and replace obsolete hardware and migrate where appropriate to wireless systems. The EMB also provided technical support services to schools. Information Technology in Education Support Center Service (ITeHelp) was launched in February 2005. It aimed at assisting teachers and Technical Support Services (TSS) staff in solving IT operational issues, and to provide a platform for sharing of IT knowledge and ideas. Furthermore, new information technologies and equipment for teaching and learning, such as interactive whiteboards, video conferencing and mobile technology, were promoted by the EMB in different trial or pilot schemes.

Providing Continuous Research and Development

The sixth strategic goal of the Second ITEd Strategy is "Providing continuous research and development". It aims at doing research on "the effectiveness of the IT in education strategy and the impact of IT on students' learning outcomes" as well as pioneering IT applications in pedagogy, education resources, school practices, curriculum integration and system development.

The EMB commissioned researches and studies for supporting the implementation and continuous development of ITEd in Hong Kong. IT Learning Targets (CDC, 2000) and the study on the Information Literacy Framework (EMB, 2005a) developed frameworks and contents for the development of school curriculum on ITEd. The EMB also commissioned two studies for the Second ITEd Strategy (2004/05-2006/07): *The Phase (I) Study and the Phase (II) Study on Evaluating the Effectiveness of the 'Empowering Learning and Teaching with Information Technology' Strategy (2004/2007*). The EMB also worked on research projects such as interactive whiteboard project and platform for consolidation and dissemination of good practices for pioneering pedagogies and for school administration and development using IT.
In the 2005/06 school year, four "Learning Centres" were established, including two which were transformed from two "Centres of Excellence" in 2004. The learning centres served as a test bed for the dissemination of innovative ways of learning and teaching through IT. The learning centres also organised seminars and workshops regularly to facilitate teachers to enhance their knowledge and skills in ITEd. They set up subject websites and developed learning resource banks for teachers. They also provided outreach support to all local primary and secondary schools on the integration of IT in learning and teaching. They encouraged teachers to take part in the activities conducted and facilitated the sharing of experience on effective use of IT. Moreover, the EMB has implemented pilot schemes in ITEd since 1998. The successful experiences and exemplars of good practice concerning IT infrastructure, pedagogies, educational resources and curriculum integration have been disseminated to the education community.

Promoting Community-wide Support and Community Building

The seventh strategic goal of the Second ITEd Strategy is "Promoting community-wide support and community building". It aims at enhancing home-school co-operation and community-school collaboration. Two key areas in home-school co-operation were studied. First of all, parents were

particularly encouraged to be involved in ITEd as the motivators of their children towards the appropriate use of IT and the home education on cyber ethics. Secondly, schools were encouraged to enhance communication with parents through the use of IT. Community-school collaboration, such as school support from the IT industry, NGOs and community organisations, contributed to ITEd in terms of training and the provision of digital resources and IT facilities. Collaborative schemes with private sector and NGOs in support of ITEd were encouraged by the EMB. A 5-year Partners in Learning (PiL) Programme offered schools with a spectrum of IT and training resources to empower students and teachers to develop their full potential through IT. The "ITeHelp" call centre, operated by Hong Kong Computer Society in collaboration with the HKEdCity provided IT support service to schools. Activities such as "Parent-Child IT Summer Camp" encouraged parents to motivate their children towards the appropriate use of IT and promote cyber ethics.

Community collaboration helps to address the issue of digital divide for the disadvantaged groups of the society and ultimately helps the capacity building of the community. While implementing the Five-year Strategy (EMB, 1998), a wide range of measures had been introduced in the community, including the provision of portable computers to needy students who did not have computers at home under the "Digital Bridge" project supported by the Quality Education Fund (QEF) as well as the provision of computers with Internet access at convenient locations (120 community or youth centres/units) for free use by the public. Under the Second ITEd Strategy, "computer recycling" and the donation in collaboration with Parent-Teacher Associations or other parties to help needy students were promoted to schools. Grant was given for extending the opening hours of school computer facilities via the Composite Information Technology Grant (CITG) to help students with easy access to computers after school and there was also funding for parental IT programmes.

The above review shows that the Government has a very clear policy on ITEd. However, the achievements depend on the implementation of various ITEd measures and this is the main question to be explored in this Study.

Chapter 3 Conceptual Framework and Research Questions

This chapter presents the conceptual framework developed from the Literature Review in Chapter 2 for the Study. It also shows the link between the conceptual framework and the eleven evaluative areas of concern identified for investigation in this Study. A set of indicators for evaluating the effectiveness of the Second ITEd Strategy is hence developed.

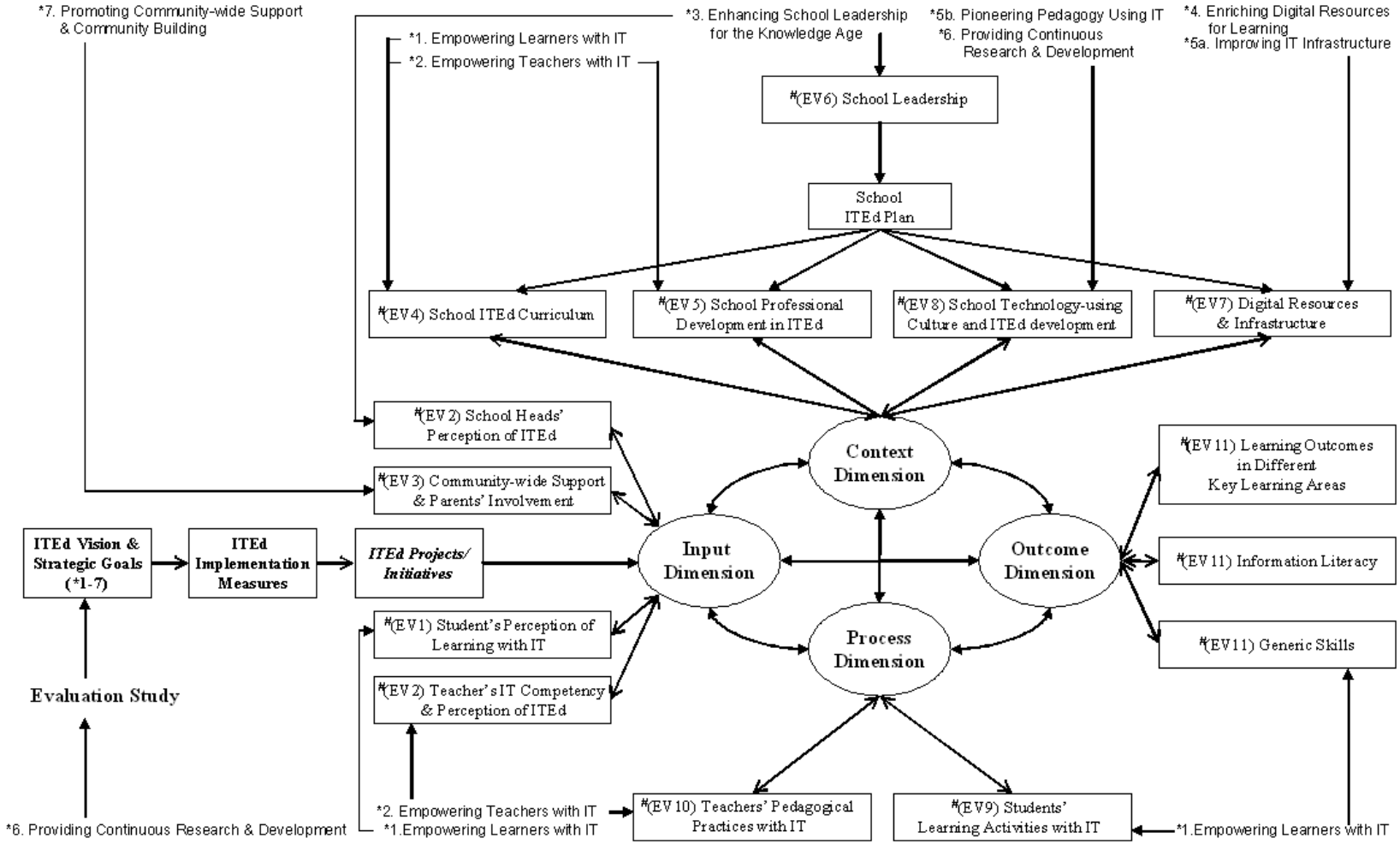
3.1 Description of the Conceptual Framework

Drawing from the notion of resource-based learning and the systemic change resulting from the impact of the use of technology on education, a conceptual framework underpinning the evaluation design of this Study has been developed and is presented in Figure 3.1 to address the areas of concern for the implementation of ITEd. The impact of using ITEd can be illustrated in four different dimensions (input, context, process and outcome) in this framework. Each of these dimensions also influences one another. As described in sections 2.1 to 2.2, sound pedagogical use of IT in the learning and teaching processes (process dimension) under a technology and resources rich environment (context dimension) can cater for the different needs of individuals who come into learning with different attributes and background (input dimension) and thus can enhance the knowledge construction in different KLAs (outcome dimension). The perception of students, school heads, teachers and parents towards learning with IT (input dimension) is considered as one of the influencing factors affecting students' learning outcomes. Problem-solving skills and collaborative skills are examples of the generic skills (outcome dimension) that can also be developed and improved when student-centred learning activities (process dimension) are employed with the use of available technological tools and resources (context dimension). Increased motivation in learning as well as changes in attitude towards learning and using computers among students are also observed (output and input dimensions respectively) when computer resources are employed. Teachers are more confident (input dimension) in using technologies in class and their teaching also changes (process dimension). As observed, teachers tend to stress on the development of creativity and higher-order thinking in student-centred activities (outcome and process dimensions respectively) when technologies are used. Their attitude towards computer changes and their use of computers in teaching also increases (input and process dimensions respectively).

Given the scope of this Study and the difference in the stages of development in the areas among the four dimensions (e.g. the implementation of the Information Literacy Framework[3]), the present evaluation attempts to look into the possible indicators in some areas that reflect the effectiveness of the ITEd measures in achieving the strategic goals. These indicators are categorised into eleven areas which are derived from the conceptual framework in Figure 3.1.

[3] This framework was developed by a consortium of four local tertiary institutions in 2005.

Figure 3.1 Theoretical conceptual framework underpinning the design of a community-wide evaluation on ITEd



* Strategic goals in 'Empowering Learning and Teaching with Information Technology' Strategy (2004/2007)
\# Evaluative areas in this Study

3.2 Indicators for Evaluation

Based on the above Conceptual Framework, the eleven evaluative areas of concern are defined. In order to examine the performance of these areas, expected outcomes for each evaluative area and the indicators of the evaluation framework on ITEd have been developed through literature review, documentary study of relevant academic and policy papers and vigorous consultations with relevant experts from the HKIEd, consultants, the research team of the EMB and honorary advisers. Each question item designed with an embedded indicator is used to evaluate the achievement of an expected outcome. More than one indicator can be used to assess a given expected outcome. Examples of indicators of the expected outcomes in one of the evaluative areas are listed below.

Evaluative Area 2:
Teachers' IT Competency as well as Teachers' & School Head's Perception of ITEd

Expected Outcome:
2a. Most of the teachers meet the IT competency requirements.

Indicators
Variable 1 Frequency of teachers/therapists' use of computer in school
Variable 2 Teachers' overall level of IT competency [Basic (BIT) Level, Intermediate (IIT) Level, Upper Intermediate (UIT) Level and Advanced (AIT) Level][4]
Variable 3 School heads' view on teachers' IT competency in the school
Variable 4 Teachers/therapists' self-evaluated level of competency in using hardware
Variable 5 Teachers/therapists' self-evaluated level of competency in using software
Variable 6 Teachers/therapists' self-evaluated level of confidence in selecting appropriate IT resources for students

Expected Outcome:
2b. Most of the teachers and school heads agree on the roles of IT in the learning, teaching and assessment process.

Indicators:
Variable 1 Teachers/therapists' view on the role of IT in learning, teaching and assessment process
Variable 2 School heads' self-evaluation on whether school head and teachers/therapists understand the role of IT in learning, teaching/training/therapy and assessment process

Expected Outcome:
2c. Most of the teachers agree on their roles when applying IT in the learning, teaching and assessment process.

Indicators:
Variable 1 Teachers/therapists' perceived roles when applying IT in learning and teaching
Variable 2 School heads' self-evaluation on whether teachers/therapists accept their roles when applying IT in learning, teaching/training/therapy and assessment

[4] Four levels of IT competency (Au, Kong, Ng & Pun, 1999).

Expected Outcome:

2d. Most of the teachers and school heads possess positive attitude towards the impact of IT on learning.

Indicators:

Variable 1 Teachers/therapists' willingness to apply IT in learning and teaching
Variable 2 Teachers/therapists' view on the factors affecting their willingness to apply IT in learning and teaching
Variable 3 School heads' willingness to support teachers to apply IT in learning and teaching
Variable 4 School heads' self-evaluation on whether school heads and teachers have positive attitude towards the impact of IT on students' learning

As far as teachers' IT competency as well as teachers' and school heads' perception of ITEd are concerned in the above examples, four expected outcomes are identified (Expected Outcomes 2a-2d). Teachers are expected to meet the IT competency requirements. Teachers and school heads are expected to demonstrate an understanding of the roles of IT in learning, teaching and assessment processes. Teachers are also expected to demonstrate an understanding of their roles when applying IT in learning, teaching and assessment processes. Teachers' and school heads' positive attitude towards the impact of IT on learning is also one of the expected outcomes. The IT competency of teachers can be assessed by six indicators, which include frequency of their use of computers in school, overall level of IT competency, self-evaluated level of competency in using hardware and software, self-evaluated level of confidence in selecting appropriate IT resources for students and school head's view on their IT competency in the school.

A list of the Expected Outcomes of the framework is presented in Table 3.1. A detailed description of the Expected Outcomes of the framework can be found in Appendix 1 of the Main Study (I) Report. This structure guides the design of relevant indicators and survey items of the questionnaires.

Table 3.1 List of the expected outcomes of the framework

Dimensions	Evaluative areas (EV)	Link to strategic goals	Expected outcomes
Input	EV1. Students' Perception of Learning with IT	1. Empowering Learners with IT	1a. Most of the students show positive attitude towards using IT in the learning process.
	EV2. Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd	2. Empowering Teachers with IT; 3. Enhancing School Leadership for the Knowledge Age	2a. Most of the teachers meet the IT competency requirements. 2b. Most of the teachers and school heads agree on the roles of IT in the learning, teaching and assessment process. 2c. Most of the teachers agree on their roles when applying IT in the learning, teaching and assessment process. 2d. Most of the teachers and school heads possess positive attitude towards the impact of IT on learning.
	EV3. Community-wide Support & Parents' Involvement	7. Promoting Community-wide Support and Community Building	3a. School derives measures to engage parents' involvement in the promotion of ITEd. 3b. School attempts to derive measures to address digital divide issue. 3c. School always makes use of community resources and takes part in community activities that support and promote the use of IT in learning and teaching. 3d. Most of the students and parents make good use of the IT resources in the community. 3e. Most of the parents are concerned about the impact of IT on students' learning. 3f. Most of the parents possess positive attitude towards the impact of IT on learning.
Context	EV4. School ITEd Curriculum	1. Empowering Learners with IT; 2. Empowering Teachers with IT	4a. Most of the students are given the opportunities to learn about the knowledge and skills of IT as well as use them in various school tasks across school curriculum. 4b. School curriculum provides a learning context that requires and enables students' use of IT as resources and tools to research issues, solve problems and communicate results. 4c. Most of the teachers understand the school ITEd curriculum.
	EV5. School Professional Development in ITEd	2. Empowering Teachers with IT; 3. Enhancing School Leadership for the Knowledge Age	5a. Teachers continue to receive ITEd professional development focusing on good practices of the application of contemporary IT to enhance learning and teaching in different KLAs. 5b. The school head and his/her associates have taken part in ITEd professional development programmes in equipping themselves with knowledge and skills leading to changes in schools, to use IT appropriately in schools for learning and teaching as well as to enhance the efficiency of school administration, for school-based assessment and as a communication tool for communicating with parents, students and other relevant parties.
	EV6. School Leadership	3. Enhancing School Leadership for the Knowledge Age	6a. An annual IT plan which shows clear visions and goals, and the implementation strategies and actions in integrating IT into school curriculum, learning and teaching processes as well as communication and collaboration is prepared, implemented and evaluated. 6b. School has a clear school-based ITEd plan to portray the infrastructure requirements, maintenance and replacement plans. This plan is based on the needs of teachers, students, parents and society. 6c. Most of the teachers are involved in and agree on the school ITEd plan. 6d. Most of the teachers have the feeling of being supported by school head and colleagues.
	EV7. Digital Resources & Infrastructure	4. Enriching Digital Resources for Learning; 5a. Improving IT Infrastructure	7a. School has developed quality school-based digital educational resources and a repository of online resources for all KLAs. 7b. School has derived an efficient management mechanism for the digital resources to facilitate teaching, learning and sharing among teachers, parents, students and other schools. 7c. School acquires up-to-date IT-based educational digital recourses regularly. 7d. School provides students and teachers with good serviceable computers and other IT facilities (hardware and application software), well-maintained school network for communication and access to multimedia rich content inside school, and sufficient bandwidth for the connection to the Internet at all times. 7e. School provides day-to-day management and maintenance of IT facilities in schools and technical support services to students and teachers. 7f. School provides sufficient consumables arising from the use of IT facilities. 7g. School provides sufficient computer facilities for use by students after normal school hours. 7h. School always improves the IT infrastructure by upgrading and replacing obsolete IT facilities to make them better support today's needs for learning and teaching. 7i. School always improves the IT infrastructure by equipping advanced IT technology to enhance learning, teaching, assessment and school administration. 7j. School has made good use of ITEd resources and funding from EMB, QEF and others sources. 7k. Most of the teachers and students have made good use of the IT facilities and services.

Table 3.1 List of the expected outcomes of the framework (Continued)

Dimensions	Evaluative areas (EV)	Link to strategic goals	Expected outcomes
Context	EV8. School Technology-using Culture and ITEd Development	3. Enhancing School Leadership for the Knowledge Age; 5b. Pioneering Pedagogy Using IT; 6. Providing Continuous Research and development	8a. School has taken part in trial or pilot project to explore innovative technologies and equipment that may enhance learning and teaching.
			8b. School attempts to research or evaluate the effectiveness of the particular pedagogy of using IT in learning and teaching and to disseminate the experiences in the education community.
			8c. School always encourages, enables and rewards collaborative team work and sharing among staff and schools to attempt innovative use of IT to enhance learning and teaching.
			8d. The use of IT has been embedded into the daily practices of a school both in the learning, teaching and assessment process, and in school administration.
Process	EV9. Students' Learning Activities with IT	1. Empowering Learners with IT	9a. Learning activities allow students to apply strategies and skills for information retrieval and critical evaluation of different information sources to build knowledge and to solve problems in school tasks and real-life situations.
			9b. Learning activities allow students to learn independently and to extend their learning opportunities using digital resources according to individuals' learning need and pace.
			9c. Learning activities allow students to plan and apply IT as a productivity tool, a communication tool, a collaboration tool, a research tool and a decision-making tool in school tasks and real-life situations.
	EV10. Teachers' Pedagogical Practices with IT	2. Empowering Teachers with IT	10a. Teachers use IT in their daily teaching and learning management such as monitoring students' learning profile.
			10b. Teachers use IT to motivate the learners, to establish the context for learning and to explain abstract concepts.
			10c. Teachers use IT as a means to monitor and to assess the performance of learners for improvement.
			10d. Teachers use assessment information to design activities that will cater for individual needs of using IT.
			10e. Teachers use IT to create a supportive learning environment for independent learning.
			10f. Teachers create opportunities for students to work collaboratively with the use of IT to construct knowledge, to develop generic competencies and Information Literacy as well as to foster positive attitude, and value judgment in doing school tasks and in using IT.
Outcome	EV11. Students' Learning Outcomes in different Key Learning Areas and the Development of Information Literacy and Generic Skills	1. Empowering Learners with IT	11a. Most of the students show mastery of the necessary knowledge about IT and the basic concepts and skills in contemporary computing technologies in relation to their corresponding key learning stages.
			11b. Most of the students show positive attitude towards social and ethical issues relating to the use of IT.
			11c. Most of the students show the ability to select the appropriate technologies and the disposition to apply the learnt knowledge and skills to solve problems in school tasks and real-life situations.
			11d. Most of the students can develop the generic skills through IT such as problem solving skills.
			11e. Most of the students show positive attitude towards using IT in the learning process.

3.3 Research Questions

Drawing from the conceptual framework and the objectives of this Study as stated in Section 1.2, the following research questions are derived:

Q1. How has IT been applied to different school sectors in Hong Kong since the 2004/05 school year?

Q1.1 How have the learners been empowered with IT in terms of students' perception of learning with IT, students' learning activities with IT and learning outcomes in Computer/IT curriculum, information literacy and generic skills?

Q1.2 How have the teachers been empowered with IT in terms of teachers' IT competency and perception of ITEd, teachers' pedagogical practices with IT and school professional development in ITEd for teachers?

Q1.3 How has the school leadership been enhanced with IT in terms of school ITEd plan, school ITEd curriculum, school technology-using culture and ITEd development as well as school professional development in ITEd for school heads?

Q1.4 How have digital resources been enriched for learning?

Q1.5 How has IT infrastructure been improved?

Q1.6 How has continuous research and development been provided in ITEd?

Q1.7 How have the schools collaborated with the community organisations and promoted parental involvement in ITEd?

Q2. What is the progress of the implementation of ITEd as from 2004/05 to 2006/07?

Q3. How has the Community Group (tertiary institutions, publishers, IT-related organisations and NGOs) been involved in the implementation of the "Empowering Learning and Teaching with Information Technology" Strategy (Second ITEd Strategy)?

Q3.1 What are the contributions of the Community Group towards ITEd in Hong Kong?

Q3.2 What are the goals and roles of the Community Group with respect to their contributions to and promotion of ITEd in Hong Kong?

Q3.3 What are the relevant projects and activities that have been or will be implemented by the organisations since the launch of the Second ITEd Strategy?

Q3.4 What are the opinions or suggestions from the Community Group regarding the implementation of ITEd in Hong Kong?

Q4. What are the possible recommendations that can be made on the ITEd projects or initiatives undertaken during the implementation of the Second ITEd Strategy?

Table 3.2 shows the relationship between the above stated research questions and the conceptual framework in terms of strategic goals, dimensions and evaluative areas. As can be seen, all the four dimensions, the eleven evaluative areas and seven strategic goals have been addressed by the Research Questions. The following Chapter will describe the research design and methodology for the Study.

Table 3.2 Relationship between research questions and conceptual framework

Research questions	Strategic goals	Dimensions	Evaluative areas (EV)
Q1. How has IT been applied to different school sectors in Hong Kong since the 2004/05 school year?			
Q1.1 How have the learners been empowered with IT in terms of students' perception of learning with IT, students' learning activities with IT and learning outcomes in Computer/IT curriculum, information literacy and generic skills?	1: Empowering Learners with IT	Input	EV1. Students' Perception of Learning with IT
		Context	EV4. School ITEd Curriculum
		Process	EV9. Students' Learning Activities with IT
		Outcome	EV11. Students' Learning Outcomes in different Key Learning Areas and the Development of Information Literacy and Generic Skills
Q1.2 How have the teachers been empowered with IT in terms of teachers' IT competency and perception of ITEd, teachers' pedagogical practices with IT and school professional development in ITEd for teachers?	2. Empowering Teachers with IT	Input	EV2. Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd
		Context	EV5. School Professional Development in ITEd
		Process	EV10. Teachers' Pedagogical Practices with IT
Q1.3 How has the school leadership been enhanced with IT in terms of school ITEd plan, school ITEd curriculum, school technology-using culture and ITEd development as well as school professional development in ITEd for school heads?	3. Enhancing School Leadership for the Knowledge Age	Input	EV2. Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd
		Context	EV4. School ITEd Curriculum
			EV5. School Professional Development in ITEd
			EV6. School Leadership
			EV8. School Technology - using Culture and ITEd Development
Q1.4 How have digital resources been enriched for learning?	4. Enriching Digital Resources for Learning;	Context	EV7. Digital Resources & Infrastructure
Q1.5 How has IT infrastructure been improved?	5. Improving IT Infrastructure and Pioneering Pedagogy Using IT	Context	EV7. Digital Resources & Infrastructure
			EV8. School Technology - using Culture and ITEd Development
Q1.6 How has continuous research and development been provided in ITEd?	6. Providing Continuous Research and Development	Context	EV8. School Technology - using Culture and ITEd Development
Q1.7 How have the schools collaborated with the community organisations and promoted parental involvement in ITEd?	7. Promoting Community-wide Support and Community Building	Input	EV3. Community-wide Support & Parents' Involvement
Q2. What is the progress of the implementation of ITEd as from 2004/05 to 2006/07?	1: Empowering Learners with IT 2. Empowering Teachers with IT 3. Enhancing School Leadership for the Knowledge Age 4. Enriching Digital Resources for Learning 5. Improving IT Infrastructure and Pioneering Pedagogy Using IT 6. Providing Continuous Research and Development 7. Promoting Community-wide Support and Community Building	Input Context Process Outcome	EV1. Students' Perception of Learning with IT EV2. Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd EV3. Community-wide Support & Parents' Involvement EV4. School ITEd Curriculum EV5. School Professional Development in ITEd EV6. School Leadership EV7. Digital Resources & Infrastructure EV8. School Technology-using Culture and ITEd Development EV9. Students' Learning Activities with IT EV10. Teachers' Pedagogical Practices with IT EV11. Students' Learning Outcomes in different Key Learning Areas and the Development of Information Literacy and Generic Skills

Table 3.2 Relationship between research questions and conceptual framework (Continued)

Research questions	Strategic goals	Dimensions	Evaluative areas (EV)
Q3. How has the Community Group (tertiary institutions, publishers, IT-related organisations and NGOs) been involved in the implementation of the "Empowering Learning and Teaching with Information Technology" Strategy (Second ITEd Strategy)?			
Q3.1 What are the contributions of the Community Group towards ITEd in Hong Kong?	7. Promoting Community-wide Support and Community Building	Input	EV3. Community-wide Support & Parents' Involvement
Q3.2 What are the goals and roles of the Community Group with respect to their contributions to and promotion of ITEd in Hong Kong?			
Q3.3 What are the relevant projects and activities that have been or will be implemented by the organisations since the launch of the Second ITEd Strategy?			
Q3.4 What are the opinions or suggestions from the Community Group regarding the implementation of ITEd in Hong Kong?	1: Empowering Learners with IT 2. Empowering Teachers with IT 3. Enhancing School Leadership for the Knowledge Age 4. Enriching Digital Resources for Learning; 5. Improving IT Infrastructure and Pioneering Pedagogy Using IT 6. Providing Continuous Research and Development 7. Promoting Community-wide Support and Community Building	Input Context Process Outcome	EV1. Students' Perception of Learning with IT EV2. Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd EV3. Community-wide Support & Parents' Involvement EV4. School ITEd Curriculum EV5. School Professional Development in ITEd EV6. School Leadership EV7. Digital Resources & Infrastructure EV8. School Technology-using Culture and ITEd Development EV9. Students' Learning Activities with IT EV10. Teachers' Pedagogical Practices with IT EV11. Students' Learning Outcomes in different Key Learning Areas and the Development of Information Literacy and Generic Skills
Q4. What are the possible recommendations that can be made on the ITEd projects or initiatives undertaken during the implementation of the Second ITEd Strategy?	1: Empowering Learners with IT 2. Empowering Teachers with IT 3. Enhancing School Leadership for the Knowledge Age 4. Enriching Digital Resources for Learning; 5. Improving IT Infrastructure and Pioneering Pedagogy Using IT 6. Providing Continuous Research and Development 7. Promoting Community-wide Support and Community Building	Input Context Process Outcome	EV1. Students' Perception of Learning with IT EV2. Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd EV3. Community-wide Support & Parents' Involvement EV4. School ITEd Curriculum EV5. School Professional Development in ITEd EV6. School Leadership EV7. Digital Resources & Infrastructure EV8. School Technology-using Culture and ITEd Development EV9. Students' Learning Activities with IT EV10. Teachers' Pedagogical Practices with IT EV11. Students' Learning Outcomes in different Key Learning Areas and the Development of Information Literacy and Generic Skills

Chapter 4 Research Design and Methods

4.1 Overview

This Study adopted a cross-sectional research design, which included two cross-sectional data collections, Main Study (I) (MS1) and Main Study (II) (MS2), carried out in October 2005 and October 2006 respectively. MS1 could yield base-line data in relation to how IT had been integrated into the learning and teaching processes in Hong Kong. The data collected in MS2 would be compared with the information obtained from the cross-sectional data collection in MS1.

Such cross-sectional research design would provide strong evidence for answering the research questions stated in Section 3.3. For research questions 1 and 2, information was collected through web-based anonymous questionnaire surveys from different stakeholders in the three school sectors (except parents of selected students and majority of students in special schools). In special situation, paper-based questionnaires were administered when a selected school did not possess the requirements of doing a web-based evaluation such as network problem. In answering research question 3, an interview guideline for semi-structural interviews was developed to solicit relevant information from representatives of selected organisations of the Community Group. To safeguard the validity of the Study, the research instruments developed by the research team were reviewed by project advisers for further refinement before the Pilot Study. After the Pilot Study, subsequent refinements of the instruments had been made before the instruments were used for the data collection of MS1. Relevant analysis report was sent to the EMB. Before writing the final evaluation report, major findings of MS1 and MS2 were sent to the project advisers to solicit third-party opinion. Their views and comments on the findings were taken into consideration before the release of the final report. In evaluating the progress of the Second ITEd Strategy (research question 2), a 'discrepancy' model was employed in this Study. A list of expected outcomes reflecting the achievement of the areas being evaluated was developed under the conceptual framework of this Study (see Chapter 3). School heads underwent a self-evaluation that reflected their perception about the levels of satisfaction of the stated expected outcomes in the evaluative areas. Evaluation rubrics were developed and added into the questionnaires of school heads for this purpose. The cross-sectional data would be compared to review the progress of the Second ITEd Strategy and identify any changes that might emerge during the period of this Study.

4.1.1 Stages of the Study

The Study was carried out in three stages: Pilot Study, MS1 and MS2.

4.1.1.1 Pilot Study

The Pilot Study aimed to verify the validity of the instruments, web-based survey administration procedures and relevant logistic arrangements. The results in the Pilot Study were not reused in MS1 and MS2. Given the main purposes of the Pilot Study as stated, a non-random sampling method was adopted for selecting participants at this stage. In this Pilot Study, 4 primary schools, 4 secondary schools and 1 special school were selected.

The data collection of the Pilot Study was carried out in two stages: Stage 1 and Stage 2. Stage 1 was conducted in early July 2005 before the summer holidays. Four primary schools and three secondary schools participated in this stage. Two stakeholder groups, students and parents, were

included. One class of students in each class level, P3 to P6 in primary schools and S1 to S6 (except S5) in secondary schools, was selected to do the online questionnaire. 10 parents of each selected class were invited to do the paper-and-pencil questionnaire. Stage 2 was held from August to September 2005. All pilot schools of the three school sectors participated in Stage 2 of the Pilot Study. Three stakeholder groups, school heads, ITEd Team teachers and teachers (including therapists of a special school) were included in this stage. Moreover, the new versions of students' and parents' questionnaires were used in one pilot secondary school. In addition, fieldwork was conducted for administering the students' and parents' questionnaires in the special school.

After the Pilot Study, the research instruments were refined and the administration procedures and logistic arrangements were fine-tuned. A Pilot Study report was prepared. The report documented all data and findings that had implications on the development of subsequent research instruments, research methodology and survey procedures.

4.1.1.2 Main Studies (I) and (II)

A cluster sampling[5] procedure was adopted for selecting stakeholders in each school sector (Primary, Secondary and Special). Simple random sampling method was then performed to decide on the respective stakeholders for the questionnaire surveys in each selected school. With the exception of parents of the three school sectors and majority of students of special schools whereby paper-based questionnaires were administered, a web-based approach was adopted for the stakeholders' questionnaire surveys in this Study. Similar procedures in MS1 in relation to the selection of schools and stakeholders within and outside schools and the survey administration were adopted in MS2.

4.2 Data Collection Methods

Quantitative and qualitative methods had been used in this Study for collecting data during the two data collection periods. Quantitative information was collected through questionnaire surveys. Qualitative information was collected from interviews with representatives from IT and ITEd-related organisations within the Community Group. Both quantitative and qualitative findings would provide an overall picture of how ITEd initiatives had been implemented. Given a combined quantitative and qualitative approach in the data collection process, the reliability of the information collected was substantiated through the triangulation of the quantitative and qualitative data from different sources in this Study (e.g. responses from stakeholders' surveys of different stakeholder groups and information from the interviews with representatives of the Community Group).

[5] "Clustering, or cluster sampling denotes the methods of selection in which the sampling unit, the unit of selection, contains more than one population element; hence the sampling unit is a cluster of elements" (Kish, 1965, p.148).

4.2.1 Questionnaire Surveys

In this Study, web-based surveys were implemented for: all school heads and school representatives/ITEd Team heads/IT co-ordinators of primary, secondary and special school sectors, ITEd Team teachers and teachers (including therapists of some special schools) of the sampled schools as well as selected students of the sampled primary, secondary and SSD (School for Social Development) schools. For the parents of the three school sectors and majority of students of special schools, traditional paper-based surveys were administered. A web-based approach was chosen because it enabled larger amount of questionnaires to be processed at the same time. As shown in many research reports, there was no difference in reliability between an online survey and a traditional paper-based survey (see e.g. Kaplowitz, Hadlock & Levine, 2004; Perkins, 2004). The Project Team made use of the *Self-evaluation Platform (SEP) on ITEd for Schools* provided by the EMB for the online data collection activities. Subsequent data analysis work was conducted by using the SPSS (*Statistical Package for the Social Science*) programme.

The web-based questionnaire survey involved a 'self-administered' process. Respondents who were provided with individual account names and passwords could complete the questionnaires themselves anywhere, anytime. All question items except those items about personal information had to be answered by the stakeholders. Submission of incomplete questionnaires (except items about personal information) was not allowed in the SEP. The system also conducted security checks to ensure that respondents could not submit the questionnaires more than once.

To encourage respondents to give 'true' responses to the question items, all surveys were conducted anonymously. Although login accounts and passwords were required, the identities of the respondents were not revealed. Any identification of group responses such as school code and class level was used for tracking the response rate only. Moreover, the system instantly aggregated the individual data of respective respondents so that retrieval of individual data was impossible. In addition, online help or hot-line enquiry was available when respondents had difficulties in completing the questionnaires.

The questionnaire surveys were categorized into two types: inside and outside school. There were seven questionnaire types for inside school surveys and one for outside school survey.

Inside school:

- School Heads' ITEd Questionnaires (Part 1) for school heads
- School Heads' ITEd Questionnaires (Part 2) for school heads
- School ITEd Survey for school representatives/IT Team heads/IT coordinators
- ITEd Team Teachers' Questionnaire for ITEd Team teachers
- Teachers' ITEd Questionnaire for all teachers (ITEd Team teachers and non-ITEd Team teachers)
- Therapists' ITEd Questionnaire for therapists in the special schools
- Students' ITEd Questionnaire for students

Outside school:

- Parents' ITEd Questionnaire for parents

A full set of questionnaire survey instruments was set out in a separate volume, namely "Study on Evaluating the Effectiveness of the 'Empowering Learning and Teaching with Information Technology' Strategy (2004/07) – Finalised Instruments: Questionnaires (English and Chinese versions)". The distribution of questionnaires by stakeholders and school sectors is presented in Table 4.1.

Table 4.1 Distribution of questionnaires with questionnaire codes by stakeholders and school sectors

School Sectors / Questionnaire Types (by Stakeholders)	Primary	Secondary	Special						Total
			Without Therapists			With Therapists			
			Hospital School (H)	School for Social Development (SSD)	School for Children with Visual Impairment (VI)	School for Children with Hearing Impairment (HI)	School for Children with Intellectual Disability (ID)	School for Children with Physical Disability (PD)	
School Head's ITEd Questionnaire (Part 1): 校長資訊科技教育問卷調查 (第一部份) (小學/中學/特殊學校) School Head's Information Technology in Education Questionnaire (Part 1) (Primary/Secondary/Special)	P1	S1	E1-1			E1-2			4
School Head's ITEd Questionnaire (Part 2): 校長資訊科技教育問卷調查 (第二部份) (小學/中學/特殊學校) School Head's Information Technology in Education Questionnaire (Part 2) (Primary/Secondary/Special)	P2	S2	E2-1			E2-2			4
School ITEd Survey: 學校資訊科技教育調查(小學/中學/特殊學校) School Information Technology in Education Survey (Primary/Secondary/Special)	P3	S3	E3						3
ITEd Team Teachers' Questionnaire: 資訊科技教育組教師問卷調查(小學/中學/特殊學校) Information Technology in Education Team Teachers' Questionnaire (Primary/Secondary/Special)	P4	S4	E4-1			E4-2			4
Teachers' ITEd Questionnaire (for both Teachers and ITEd Team Teachers): 教師資訊科技教育問卷調查(小學/中學/特殊學校) Teachers' Information Technology in Education Questionnaire (Primary/Secondary/Special)	P5	S5	E5						3
Students' ITEd Questionnaire: 學生資訊科技教育問卷調查(小學/中學/特殊學校) Students' Information Technology in Education Questionnaire (Primary/Secondary/Special)	P6	S6	E6-1	E6-2	E6-3	E6-4	E6-5	E6-6	8
Parents' ITEd Questionnaire: 家長資訊科技教育問卷調查(小學/中學/特殊學校) Parents' Information Technology in Education Questionnaire (Primary/Secondary/Special)	P7	S7	N.A.	E7-1		E7-2			4
Therapists' ITEd Questionnaire: 治療師資訊科技教育問卷調查 (特殊學校) Therapists' Information Technology in Education Questionnaire (Special)	N.A.	N.A.	N.A.			E8			1

Types of questionnaires for different stakeholders with respect to the evaluative areas are presented in Table 4.2.

School Heads' Information Technology in Education Questionnaires (Part 1 and Part 2) (School Heads' ITEd Questionnaires)

All school heads for the three school sectors were surveyed by the School Heads' ITEd Questionnaires, which consisted of two parts: 8 items in part 1 and 18 items (except the question item for other comments) in part 2. In the School Head's ITEd Questionnaire (Part 1), school heads were required to reflect on the levels of satisfaction (namely 'Very satisfied', 'Satisfied', 'Quite satisfied (一般)', 'Not satisfied' and 'Totally not satisfied') with respect to the expected outcomes described under each area. An example is shown as follows:

EV & EO	Q	Question items in School Head's ITEd Questionnaire (Part 1)	Levels of Satisfaction				
			Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied
2a.	2a	Teachers' IT competency meets the requirements of Education and Manpower Bureau.	☐	☐	☐	☐	☐
2b.	2b	School head and teachers understand the function of IT in the learning, teaching and assessment processes.	☐	☐	☐	☐	☐
2c.	2c	Teachers understand their roles when applying IT in the learning, teaching and assessment processes.	☐	☐	☐	☐	☐
2d.	2d	School head and teachers demonstrate positive appraisal on the impact of IT on learning.	☐	☐	☐	☐	☐

School Head's ITEd Questionnaire (Part 2) was designed to survey a broad range of facts and opinions as reflected by the school heads. The items mainly focused on the evaluative areas which were related to school heads' perception of ITEd, school leadership, school ITEd curriculum, community-wide support and parents' involvement, school professional development in ITEd, digital resources and infrastructure, as well as school technology-using culture and ITEd development.

School Information Technology in Education Survey (School ITEd Survey)

All schools in the three school sectors were invited to complete the School ITEd Survey. The survey was designed for collecting factual information of IT facilities and ITEd curriculum in schools. In this questionnaire, there were 8 items focusing on school basic information, school IT facilities and school computer and IT curricula. Each school was requested to assign a school representative [e.g. ITEd Team head or IT coordinator (ITC)] to complete the School ITEd Survey.

Teachers'/Therapists' Information Technology in Education Questionnaire (Teachers'/Therapists' ITEd Questionnaire)

Teachers of primary, secondary, and special schools were surveyed by the Teachers' ITEd Questionnaire. Therapists in special schools were surveyed by a customized set of questionnaires based on the Teachers' ITEd Questionnaire. Major modifications were made to match better with therapists' job duties and involvement in ITEd in special schools. The questionnaire was designed to collect information and opinions on the following evaluative areas: their IT competency as well as their perception of ITEd, community-wide support and parents' involvement, school ITEd curriculum, school professional development in ITEd, school leadership, digital resources and infrastructure, school technology-using culture and ITEd development, students' learning activities with IT, pedagogical practices with IT and students' learning outcomes. Except the question item for other comments, there were 35 questionnaire items for teachers in three school sectors and 32 questionnaire items for therapists of special schools.

Information Technology in Education Team Teachers' Questionnaire (ITEd Team Teachers' Questionnaire)

Those teachers who were also IT team members were invited to fill in the ITEd Team Teachers' Questionnaire in addition to the Teachers' ITEd Questionnaire. This questionnaire was designed to probe into the school's adoption of ITEd in terms of the school ITEd curriculum, school professional development in ITEd, digital resources and infrastructure in schools, school technology-using culture and ITEd development, community-wide support and parents' involvement as well as school leadership. There were 7 items in this questionnaire.

Students' Information Technology in Education Questionnaire (Students' ITEd Questionnaire)

Selected students in the sampled schools were surveyed by the Students' ITEd Questionnaire. The questionnaires for primary school and secondary school students were basically the same, except for some slight variations to cater for different curriculum subjects. The questionnaires for special school students were customized by the school categories. The question items were customized in terms of the subjects, the use of special assistive devices for IT and therapists' use of IT for their therapy and training. There were 24 items for students of primary, secondary and special schools for SSD and VI. There were 23 items for students in special school for H, 26 items for students in special schools for HI and PD and 27 items for students in special schools for ID.

Parents' Information Technology in Education Questionnaire (Parents' ITEd Questionnaire)

Except the question item for other comments, there were 25 items in the Parents' ITEd Questionnaire for primary and secondary schools whereas 26 items were set for that of special schools. The items focused on the evaluative areas of community-wide support and parents' involvement, digital resources and infrastructure as well as students' learning activities with IT. One special item (questions 5d and 5e) was included in the Parents' ITEd Questionnaire for special schools with therapists, regarding the therapists' use of IT in students' therapy and training.

Table 4.2 Types and evaluative areas for questionnaire surveys

Evaluative areas (EV)		Questionnaire types						
		Inside school surveys [a]						Outside school survey
		School Heads (Part 1)	School Heads (Part 2)	School ITEd Survey	ITEd Team Teachers	Teachers and Therapists	Students	Parents
1.	Students' Perception of learning with IT	✓					✓	
2.	Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd	✓	✓	✓		✓		
3.	Community-wide Support & Parents' Involvement	✓	✓	✓	✓	✓	✓	✓
4.	School ITEd Curriculum	✓	✓	✓	✓	✓	✓	
5.	School Professional Development in ITEd	✓	✓		✓	✓		
6.	School Leadership	✓	✓		✓	✓		
7.	Digital Resources & Infrastructure	✓	✓	✓	✓	✓	✓	✓
8.	School Technology-using Culture and ITEd Development	✓	✓		✓	✓	✓	
9.	Students' Learning Activities with IT	✓				✓	✓	✓
10.	Teachers' Pedagogical Practices with IT	✓				✓	✓	
11.	Students' Learning Outcomes in different key learning areas and the development of information literacy and generic skills	✓				✓	✓	

[a] Minor adjustments were made in the questionnaire for special school teachers/therapists and students.

All questionnaires were developed by the Project Team with reference to the Study Objectives, Research Questions, Literature Review and Conceptual Framework. During the developmental process, review of all questionnaires was conducted by the consultants, honorary advisers and the EMB. A trial-run was carried out by using these instruments in each stage of the Pilot Study in July 2005 and September 2005. The findings from the Pilot Study, together with experience from the field work and advice from consultants and honorary advisers, were used to refine the questionnaires. Major revisions included:

a. adding new items to the pilot questionnaire(s) to tap information related to important variables derived from the construct map;
b. modifying the wording or options to improve the clarification of questionnaire items and to enhance the appropriateness of the options given in an item; and
c. structuring the questionnaires with appropriate logical sequence and length.

Finalised questionnaires were used in both MS1 and MS2.

4.2.2 Review of EMB Documents

A set of documents relating to ITEd initiatives was delivered to the HKIEd by the EMB. A systematic review of the set of documents about various ITEd projects that were launched from 2004/05 to 2006/07 school years was conducted. The aim of the review of the EMB documents was to identify the progress of the implementation of various ITEd initiatives or projects for each strategic goal carried out by the EMB. Relevant information was utilized where appropriate to provide further evidence for addressing the sets of Research Questions of the Study.

4.2.3 Focus Group Interviews

Focus group interviews were conducted with representatives of the selected organisations in the Community Group parallel to the data collection periods of MS1 and MS2. Nine focus group interviews for 9 organisations from the Community Group [2 IT-related organisations, 3 NGOs, 2 publishers and 2 tertiary institutions] were conducted.

The aim was to collect supplementary information on:

a. the contribution of the organisation towards ITEd in Hong Kong;
b. the goal(s) and role(s) of the organisation in promoting ITEd (if they had planned for any contribution to ITEd);
c. the relevant projects and activities that had been or would be implemented by the organisation since the launch of the Second ITEd Strategy, which might comprise research activities, workshops, seminars, competitions and provision of resources to schools, teachers, students and parents; and
d. opinions or suggestions from these organisations regarding the implementation of ITEd in Hong Kong.

A loosely-structured free-flowing approach was adopted in the interview with a small group of 2 to 6 people to encourage interactive discussion. The interview was conducted within one and a half hours. The interviewer acted as a facilitator and encouraged participants to discuss and express their opinions about the focused topics. A set of proposed leading questions was prepared and was attached in the finalised “Main Study (I) Report”. To avoid misinterpretation and difficulties in recalling the conversations, recording of the interviews with the consent of the participants was conducted.

4.2.4 Arrangements for Special School Sector

To maintain consistency and comparability of the data across school sectors for reviewing the progress and evaluating the ITEd initiatives in Hong Kong, the same core methodology was adopted for primary, secondary and special school sectors. However, some slight modifications to the methodology were required to customise the instruments and to adapt to the unique context or needs of the special schools. The following special arrangements were made for these purposes:

- Modifications were made to some of the items in the School Heads’, Teachers’ and Students’ ITEd Questionnaires, with some items or options modified or added to deliberately capture information unique to the context of special schools.
- For special school students who were taking the mainstream curriculum, the corresponding questionnaires of primary or secondary school sector were used.

- The data collection process involving special school students, especially students in ID was conducted with guidance and aid from teachers who were familiar with the students to ensure consistency and validity of their answers. In addition, for students with visual impairment, the questionnaires were printed in larger font size. For students with mild, moderate or severe intellectual disabilities, i.e. the ID students taking special curriculum, on-site support and interviews with the respective teachers were provided upon request.

4.3 Data Analysis Methods

This section introduces the quantitative and qualitative data analysis methods used in this Study.

4.3.1 Analysis of Quantitative Data

Quantitative data refers to the data collected from the questionnaire surveys for various stakeholders. The statistical analysis methods of the quantitative data and relevant weighting measures are described in this section.

4.3.1.1 Questionnaire Surveys

The data collected from questionnaire surveys were analysed by school sector, i.e. Primary, Secondary and Special. In order to address the Research Questions, questionnaire items were categorized into eleven evaluative areas according to the conceptual framework defined in this Study as follows:

EV1: Students' Perception of Learning with IT
EV2: Teachers' IT Competency as well as Teachers' & School Heads' Perception of ITEd
EV3: Community-wide Support & Parents' Involvement
EV4: School ITEd Curriculum
EV5: School Professional Development in ITEd
EV6: School Leadership
EV7: Digital Resources & Infrastructure
EV8: School Technology-using Culture and ITEd Development
EV9: Students' Learning Activities with IT
EV10: Teachers' Pedagogical Practices with IT
EV11: Students' Learning Outcomes in Different Key Learning Areas (KLAs), Information Literacy and the Development of Information Literacy and Generic Skills

The items were mainly in the form of 'Single Selection', 'Multiple Selection' and '5-point Likert Scale'. All raw data files were exported from the "SEP on ITEd for Schools". The statistical analysis was conducted by using the SPSS. Descriptive statistics such as total number of valid responses (N) and percentage distributions together with base number of respondents were reported for categorical or dichotomous data. For ordinal and numeric data, more statistical information including the total number of valid responses (N), mean (M), standard deviations (SD) and the standard error of means (SE) were computed. The extent of sampling error for this Study was set at 95% confidence level. Thus, the upper and lower limits of confidence interval were also reported [Upper 95% confidence limit (UCL) and Lower 95% confidence limit (LCL)]. The Listwise strategy was adopted for the missing data in the School Head's ITEd Questionnaire (Part

1). Overall summary of descriptive analysis of the questionnaire surveys for MS1 and MS2 was documented by school sectors in Appendices 1 and 2 respectively.

In order to track the progress of the implementation of ITEd from MS1 and MS2, Mann-Whitney U Test and Chi-square Test were used to test the significant difference in selected ordinal and categorical question items of different stakeholder surveys between MS1 and MS2 respectively.

4.3.1.2 Weighting Measures

Weightings were applied to the Students' ITEd Questionnaire and the Parents' ITEd Questionnaire to adjust for the design of the two-stage cluster sampling method[6] based on the direct proportion to the inverse of the selection probability of each student or parent in the sampled schools. Both the size of schools and classes were taken into consideration. Weightings for the subgroup analysis were performed in the Students' ITEd Questionnaire data, while weightings for the combined group analysis were performed in the Parents' ITEd Questionnaire data. The weighting was formulated as follows:

The weighting score of a class level of a sampled school $= \frac{x_i}{y_i} \times \frac{\sum_{i=1}^{n} y_i}{\sum_{i=1}^{n} x_i}$ where

x_i is the total number of students of the class level of the sampled school,
y_i is the number of respondents of the selected class of the class level of the sampled school,
n is the total number of sampled schools of a school sector.

No weighting was applied on full enumeration and one-stage cluster sampling[7], including School Heads' ITEd Questionnaires (Part 1 and Part 2), School ITEd Survey, ITEd Team Teachers' Questionnaire and Teachers' ITEd Questionnaire (including Therapists' ITEd Questionnaire for special school sector).

4.3.1.3 Reliability

Based on the data from MS1, reliability test was conducted for School Heads' ITEd, ITEd Team Teachers', Teachers' ITEd, Students' ITEd and Parents' ITEd Questionnaires of primary and secondary school sectors using SPSS version 12. However, reliability test was not required for School ITEd Survey which was intended for garnering the factual data for school IT facilities and information on school IT curriculum only. In addition, no reliability test was conducted for the raw data of different stakeholders in special schools as the sample sizes of different stakeholder groups were too small.

[6] Two-stage cluster sampling method: one class of students per selected class level was randomly selected from the sampled schools.

[7] One-stage cluster sampling method: all the stakeholders in respective groups in a sampled school were invited to do the respective questionnaires.

The reliability test results for School Heads', ITEd Team Teachers', Teachers', Students' and Parents' ITEd Questionnaires of primary and secondary school sectors are reported in Table 4.3.

Table 4.3 Reliability test results for School Heads', ITEd Team Teachers', Teachers', Students' and Parents' ITEd Questionnaires of primary and secondary school sectors

Questionnaire types	Primary school sector			Secondary school sector		
	No. of items	No. of respondents (Valid) [a]	Cronbach's Alpha Reliability	No. of items	No. of respondents (Valid) [a]	Cronbach's Alpha Reliability
School Head's ITEd Questionnaire (Part 1)	53	551	0.968	53	397	0.964
School Head's ITEd Questionnaire (Part 2)	55	539	0.835	55	(375) 390	0.809
ITEd Team Teachers' Questionnaire	57	334	0.886	57	339	0.894
Teachers' ITEd Questionnaire	136	(1481) 1830	0.766	136	(2136) 2727	0.763
Students' ITEd Questionnaire	96	(2831) 3739	0.814	96	(5200) 6189	0.806
Parents' ITEd Questionnaire	37	(2831) 3340	0.856	37	(5203) 5891	0.846

[a] Listwise deletion based on all variables in the procedure

4.3.2 Analysis of Qualitative Data

There were three sources of qualitative data in this Study: the EMB documents, the textual responses from questionnaire surveys (if applicable) and the interviewing notes or transcripts from the interviews of the representatives of the Community Group. Qualitative data analysis consisted of a series of data clustering process which involved "three concurrent flows of activities: data reduction, data display and conclusion drawing or verification" (Miles & Huberman, 1994, p.10). The purpose of this data clustering process was to identify patterns or categories and relationship that might emerge from the data.

4.3.2.1 Review of EMB Documents

A set of documents relating to various ITEd initiatives or projects, launched from 2004/05 to 2006/07 school years, provided by the EMB was reviewed. The documents were classified according to the seven strategic goals and examined based on the research questions and evaluative areas.

4.3.2.2 Open-ended Items in Questionnaire Surveys

Textual responses, such as 'other comments' from questionnaire surveys for school heads, teachers and parents, were collected. However, no textual response was collected from students for easy administration of online survey owing to time limitation and IT competency requirement for textual input. The data of textual responses were clustered into different categories (dimensions, evaluative areas, themes and strategic goals). Responses or answers might include additional information or suggestions other than the evaluative areas. Theme(s) would then be defined. A table showing the frequency of occurrence of each category was used to summarize the information gathered. Conclusion was then drawn to explain the relationships or meaning of the data.

4.3.2.3 Focus Group Interviews

Nine focus group interviews were conducted parallel to the data collection periods of MS1 and MS2. There were two sources of qualitative data for the Community Group Interviews:

- documents including the background and missions of the organisations related to ITEd; and
- interviewing notes or transcripts from the interviews of the representatives of the Community Group.

The documents for analysis were collected through relevant websites, by mail(s) or e-mail(s) to the selected organisations. The main purpose was to supplement to and triangulate with the data collected through interviews. The main ideas from group discussions were transcribed. A transcript was classified and coded with the evaluative areas, themes and strategic goals developed, as well as any new topics or issues. At the end of this analysis process, the data was clustered into different categories (dimensions, evaluative areas, themes and strategic goals). A table showing the frequency of occurrence of each category was used to summarise the information gathered. Conclusion was then drawn to explain the relationships or meaning of the data.

4.4 Quality Assurance (QA) Measures

4.4.1 Consultants and Honorary Advisers

Besides the core Project Team members, three consultants were invited to give advice on the implementation as well as to scrutinise the progress and major deliverables of the Study.

As stated in the Project Plan, an honorary advisory group, which was composed of members of experienced school heads and teachers from primary, secondary and special school sectors as well as relevant experts from the tertiary education sector and ITEd-related organisations, was formed. Various documents prepared by the Project Team throughout the Study were sent to these advisers for comments and recommendations.

4.4.2 Data Accuracy and Reliability Measures of Web-based Evaluation System

This Study used the "Self-Evaluation Platform (SEP) on ITEd for Schools" developed by the EMB as the web-based data collection tool. The SEP was designed for schools to conduct self-evaluation of their performance and progress in ITEd by collecting useful information from different stakeholders such as school heads, teachers, students, and parents. SEP servers were connected to Internet via HARNET which was managed by the Joint University Computer Centre (JUCC) with guarantee network services. The traffic jam or system hang-up resulted from a large proportion of respondents logging on the system at the same time was avoided.

In order to collect valid and reliable data from these stakeholders, at the administrative level of MS1 and MS2, the SEP adopted a closed surveying strategy in which the identities of all stakeholders, i.e. login accounts and passwords, were known. Such measure prevented the interference from unknown users and safeguarded the accuracy of the number of responses from the stakeholders as double entry was not feasible under such strategy. In addition, an accurate response rate was calculated since the system was able to trace the non-respondents easily. The design of the SEP had also considered the ethical issue concerning the anonymity of a survey. The

account information was assured not to be used to differentiate the identity of any respondent but was used for tracking the response rate only. Moreover, the responses to the survey items by an individual were not saved unless a named survey was conducted (in this case, the survey respondents were informed well in advance before the survey). As a result, the system would instantly aggregate the individual data of respective respondents collected so that retrieval of individual data became impossible. Only the aggregated information of all the survey respondents in the SEP survey groups was displayed. Such mechanism had substantiated the accuracy of data being collected through this system. Regarding the reliability of an online survey, many studies had proved to have no difference from traditional paper-based survey (e.g. Kaplowitz, Hadlock & Levine, 2004; Perkins, 2004). A web-based survey was an appropriate solution to such a resource-demanding situation in which an estimate of over 30,000 questionnaires would be collected for each data collection exercise in this Study.

4.4.3 Measures to Ensure Data Quality and Contingency Measure

To ensure the high quality of the data collection and findings of the Study, a number of quality assurance procedures and contingency measures were adopted, including:

- A detailed training manual with operational procedures of interviews, handling of hotline, follow-up calls, data inputting and data cleaning etc. was prepared and explained to each staff member involved.
- The Project Team made all possible attempts to ensure that the minimum target response rates had been achieved. For those sampled schools with low response rates for different stakeholder groups, follow-up calls, e-mails and faxes were made. Cases where problems encountered by schools were spotted and immediate measures were carried out to prevent any delay.
- The hotline and the e-mail account, which were managed by administrative staff of the Project Team, served as contact points between the public (schools, parents and the Community Group) and the Project Team.
- Hardcopies of web-based evaluation instruments were prepared. All softcopies of questionnaires, interview forms and data sets were duplicated for backup. All the data were placed in a locked and secure location.
- The SEP maintenance team[8] designed and implemented the failover and load balancing solution.
- Post-enumeration check was conducted for those inconsistent responses by senior staff members to ensure the accuracy of the data collected.

[8] The SEP maintenance team provided relevant service to the EMB in accordance with the service specifications set out in the 'Provision of Maintenance and Support Services (1 June to 31 August 2005) for Self-evaluation Platform (SEP) on Information Technology in Education (ITEd) for Schools'.

4.5 Limitations of the Study

The Project Team joined the evaluation exercise at the beginning of the Second ITEd Strategy, making it possible to collect information via the same set of questionnaires twice at two different intervals. However, given limited resources, there were limitations which deserved our attention when conducting the two main data collections in this Study.

Contract Period

It was a 20-month contract to evaluate the effectiveness of the ITEd projects or initiatives, a period long enough just to measure short-term effects and changes. Many research works pointed out that significant change, especially 'first order' change would take as long as five years to come (Cuban, 2001). In this regard, the Project Team would appreciate the possibility if longitudinal study could be conducted instead of implementing cross-sectional study in MS2. Our suggestion was that the question items in MS2 should match the question items in MS1 as far as possible. This would give a more comprehensive picture of how the use of IT in schools had impacted on students' learning over a longer period of time. Many ITEd projects or initiatives had been or were being implemented in public schools. They were developed with diversified philosophical underpinnings and thus made it difficult to set performance indicators that were both comprehensive and easy to define.

Research Instruments

It was well documented that every research instrument had its strengths and weaknesses. The use of structured questionnaire survey conducted with a proper sampling method and under strict administrative procedures would yield reliable results and facilitated generalization. However, there were limitations on the use of questionnaire surveys, especially when self-evaluation items were included. The respondents were not given any choices other than the suggested ones that might suit their particular needs or views. Moreover, respondents would lose their focus when completing a long questionnaire. They might misunderstand the meaning of a survey item; and might not be able to make correct judgments purely by self-reflection. A combination of research instruments would be an appropriate measure in this regard, such as conducting qualitative research through interviews and class observations. In particular, qualitative study or case study was more appropriate than quantitative study for the special school sector in this Study. However, these options were only available for a very large-scale evaluation study only.

Sampling of the Special School Sector

Owing to resource constraints and the limited number of special schools involved in the Study, a representative sampling for the special school sector had not been drawn. Moreover, teachers in pilot special schools alerted the Project Team of students' high absence rate and parents' low response rate. Hence, the findings of this Study could not be generalized to the whole special school sector.

Chapter 5 Research Samples, Sampling Methods and Response Rates

5.1 Research Samples

The main target population of this Study included: school heads, school representatives/ITEd Team heads/ITCs, ITEd Team teachers (i.e. teachers involved in the ITEd Team), teachers, students, and parents of primary, secondary and special schools as well as therapists of special schools. Questionnaire surveys to these target groups provided information required for answering research questions 1 and 2. This Study also included focus group interviews with experts and professionals in the IT and ITEd-related community such as tertiary institutions, publishers and NGOs. The interviews provided information for answering research question 3 as stated in Section 3.3.

5.2 Sampling Methods

This Study employed a cluster sampling[9] method in each of the school sectors (Primary, Secondary and Special) (Table 5.1). To uphold more desirable and representative samples, full enumeration was conducted on the School Heads' ITEd Questionnaires (Part 1 and Part 2) and the School ITEd Survey. For other stakeholder groups, cluster sampling method was adopted. Around 10% to 15% of the schools were randomly selected whereby one-stage or two-stage clustering sampling was conducted. One-stage cluster sampling method - all the stakeholders in selected groups in a sampled school were invited to do the respective questionnaires - was employed to both the ITEd Team Teachers' Questionnaire and the Teachers' ITEd Questionnaire (including Therapists' ITEd Questionnaire for special school sector), i.e. all ITEd Team teachers and non-ITEd Team teachers (including therapists in special schools) of the sampled schools were invited to do the respective surveys. On the other hand, two-stage cluster sampling method - one class of students per selected class level was randomly selected from the sampled schools - was employed to the Students' ITEd Questionnaire and the Parents' ITEd Questionnaire. The detailed sampling schemes for different stakeholders are presented in Section 5.3.

[9] For details of 'cluster sampling', please refer to the footnote 5 under section 4.1.1.2.

Table 5.1 Sampling schemes adopted by school sectors and stakeholders

Questionnaire types	**Stakeholder groups**	**Sampling scheme by school sector by stakeholder group (Sampling unit by stage)**		
		Primary	**Secondary**	**Special**
School Heads' ITEd Questionnaires (Part 1) and (Part 2)	School Heads	Full enumeration		
School ITEd Survey	School representative/ITEd Team head/ITC	Full enumeration		
ITEd Team Teachers' Questionnaire and Teachers' ITEd Questionnaire	ITEd Team Teachers	One-stage cluster sampling (School)		
Teachers' ITEd Questionnaire/ Therapists' ITEd Questionnaire	Non-ITEd Team Teachers/ Therapists	One-stage cluster sampling (School)		
Students' ITEd Questionnaire	Students	Two-stage cluster sampling (First Stage – School) (Second Stage – Class)		
Parents' ITEd Questionnaire	Parents	Two-stage cluster sampling (First Stage – School) (Second Stage – Class)		

5.2.1 Coverage

Table 5.2 shows the total number of primary, secondary and special schools for MS1 and MS2.

In MS1, the total number of schools in respective school sector was as follows:

- 623 primary schools (including Aided Schools, Direct Subsidy Schools and Government Schools);
- 471 secondary schools (including Aided Schools, Caput Schools, Direct Subsidy Schools and Government Schools); and
- 61 special schools (special schools were classified into six categories: H, HI, ID, PD, SSD and VI).

In MS2, the total number of schools in respective school sector was:
- 549 primary schools;
- 468 secondary schools; and
- 60 special schools.

All schools in the three school sectors were invited to complete School Heads' ITEd Questionnaires (Part 1 and Part 2) and School ITEd Survey.

5.2.2 Sampled Schools

The sample size of the population expected for a descriptive research in the three school sectors was made at 10% to 20% of the population (Gay & Airasian, 2003). The number of sampled schools for respective school sector is presented in Table 5.2. In MS1, 68 sampled primary schools, 72 sampled secondary schools and 10 sampled special schools were invited to complete a full set of questionnaires for different stakeholders. In MS2, 72 sampled primary schools, 72 sampled secondary schools and 10 sampled special schools were invited to complete a full set of questionnaires for different stakeholders.

Table 5.2 Total number of schools in respective school sector and the number of sampled primary, secondary and special schools for MS1 and MS2

School sectors			**Main Study (I) (MS1)**			**Main Study (II) (MS2)**		
			Total no. of schools		**Total no. of sampled schools**	**Total no. of schools**		**Total no. of sampled schools**
Primary			**623**		**68**	**549**		**72**
Secondary			**471**		**72**	**468**		**72**
Special			**61**		**10**	**60**		**10**
Special school categories		**No. of ID schools**	**Total no. of schools**	**No. of sampled ID schools**	**Total no. of sampled schools**	**Total no. of schools**	**No. of sampled ID schools**	**Total no. of sampled schools**
H:	Hospital School[a]		1		1	1		1
HI:	School for Children with Hearing Impairment		4		1	3		1
ID:	School for Children with Intellectual Disability		41		4	41		3
M:	*School for the Mildly Intellectually Disabled*	*10*		1			0[b]	
Mmod:	*School for the Mildly and Moderately Intellectually Disabled*	*7*		1			1	
Mod:	*School for the Moderately Intellectually Disabled*	*14*		1			1	
S:	*School for the Severely Intellectually Disabled*	*10*		1			1	
PD:	School for Children with Physical Disability		7		1	7		2
SSD:	School for Social Development		7		2	7		2
VI:	School for Children with Visual Impairment		1		1	1		1

[a] One hospital school represents 17 hospital centres. Only 13 hospital centres which provided regular hospital school services were included in this Study.

[b] One sampled ID-M school was invited to join the full set of questionnaire survey. However, due to resignation of ITEd staff in the school, the school head rejected to join the full set of questionnaire survey and participated in the School Heads' ITEd Questionnaires (Part 1 and Part 2) and the School ITEd Survey only.

5.3 Sampling Scheme and Response Rates for Target Stakeholders

The cut-off dates for data collection of MS1 and MS2 were 13 January 2006 and 26 November 2006 respectively. Six target groups were covered in the Study, namely:

- School heads;
- School representatives/ITEd Team heads/ITCs;
- ITEd Team teachers;
- Teachers (including therapists in special schools);
- Students; and
- Parents.

The following sections give an account of the actual sample size as well as the response rates of different instruments by school sector within sampled schools and the overall response rates in sum of all schools.

School Heads' ITEd Questionnaires (Part 1 and Part 2) and School ITEd Survey

All schools in the three school sectors were included in the School Heads' ITEd Questionnaires (Part 1 and Part 2) and the School ITEd Survey.

Selection of Other Stakeholders within Sampled Schools

Sampled schools in the three school sectors were invited to complete ITEd Team Teachers', Teachers' (including therapists in special schools), Students' and Parents' ITEd questionnaires in addition to School Heads' ITEd Questionnaires (Part 1 and Part 2) and School ITEd Survey.

For the selection of relevant stakeholders from the three school sectors, a sampling scheme is shown in Table 5.3.

Table 5.3 Sampling scheme of relevant stakeholders within sampled schools

School sectors	Stakeholder groups	Sampling scheme
Primary schools Secondary schools Special schools	ITEd Team Teachers (i.e. teachers involved in the ITEd Team)	All ITEd Team teachers in the selected schools
	Teachers	All teaching staff in the selected schools
	Students	Random selection of one class from: Primary Schools (P4 & P6); Secondary Schools (S2, S4 & S6) Special Schools - For special schools implementing special curriculum (i.e. ID school), P4, S1 and 1st year of EYE were selected[a]; and - For special schools implementing mainstream curriculum, P4, P6, S2 and S4 were selected. - For hospital school, all P4, P6, S2 students in medical paediatrics wards for 7 days or more were included in this Study.
	Parents	All parents (except hospital school[b]) of the selected students
	Therapists (for special schools only)	All therapists in the selected schools

[a] P4, S1 and 1st year of EYE levels represented the key learning stages in ID schools.

[b] Taken into consideration the transitional education period, ethical and humanity concerns and the views of such parents (majority of those children might come from mainstream schools) might have already been garnered from Parents' ITEd Questionnaires of the primary and secondary school sectors, parents of the hospitalized students were not requested to complete the parents' questionnaires.

Table 5.4 summarises the total number and response rates of different stakeholder groups in primary, secondary and special school sectors for MS1 and MS2. Summary of overall response rates of different stakeholder groups for MS1 and MS2 is reported in Table 5.5.

Generally speaking, the response rates of most stakeholder groups were over 70%. The response rates of all stakeholder groups in MS1 and MS2 were over 50% except for the teachers in secondary school sector in MS2. Owing to the shortening of the second data collection period, lower response rates were unavoidable in MS2. Furthermore, a slightly lower response rate from teachers might be due to the lengthy questionnaire and heavy workload at the beginning of the school year.

Table 5.4 Overall response rates of different stakeholder groups by school sectors for MS1 and MS2

School sectors	Questionnaire types	MS1			MS2		
		No. of stakeholders/ sampled stakeholders	Total no. of responded stakeholders	Response rate	No. of stakeholders/ sampled stakeholders	Total no. of responded stakeholders	Response rate
Primary	A. Full enumeration						
	1. School Head's ITEd Questionnaire (Part 1)	623	551	88%	549	445	81%
	2. School Head's ITEd Questionnaire (Part 2)	623	539	87%	549	440	80%
	3. School ITEd Survey	623	549	88%	549	435	79%
	B. Sampled schools						
	4. ITEd Team Teachers' Questionnaire	395	334	85%	432	332	77%
	5. Teachers' ITEd Questionnaire	2422	1830	76%	2708	1804	67%
	6. Students' ITEd Questionnaire	4423	3739	85%	4820	4020	83%
	7. Parents' ITEd Questionnaire	4423	3340	76%	4820	3656	76%
Secondary	A. Full enumeration						
	1. School Head's ITEd Questionnaire (Part 1)	471	397	84%	468	354	76%
	2. School Head's ITEd Questionnaire (Part 2)	471	390	83%	468	351	75%
	3. School ITEd Survey	471	388	82%	468	353	75%
	B. Sampled schools						
	4. ITEd Team Teachers' Questionnaire	418	339	81%	379	229	60%
	5. Teachers' ITEd Questionnaire	4051	2727	67%	4154	2053	49%
	6. Students' ITEd Questionnaire	7812	6189	79%	7581	5136	68%
	7. Parents' ITEd Questionnaire	7812	6033	77%	7581	4394	58%
Special	A. Full enumeration						
	1. School Head's ITEd Questionnaire (Part 1)	61	54	89%	60	52	87%
	2. School Head's ITEd Questionnaire (Part 2)	61	58	95%	60	52	87%
	3. School ITEd Survey	61	55	90%	60	55	92%
	B. Sampled schools						
	4. ITEd Team Teachers' Questionnaire	45	40	89%	36	31	86%
	5. Teachers' ITEd Questionnaire	264	191	72%	247	196	79%
	6. Therapists' ITEd Questionnaire	30	25	83%	28	27	96%
	7. Students' ITEd Questionnaire	242	215	89%	311	219	70%
	8. Parents' ITEd Questionnaire	232	128	55%	295	164	56%

Table 5.5 Summary of overall response rates of different stakeholder groups for MS1 and MS2

Questionnaire types	Stakeholder groups	MS1			MS2		
		No. of stakeholders	Total no. of Responded stakeholders	Actual response rate	No. of stakeholders	Total no. of Responded stakeholders	Actual response rate
A. Full enumeration							
1. School Head's Information Technology in Education Questionnaire (Part 1)	School Heads	1155[a]	1002	87%	1077[b]	851	79%
2. School Head's Information Technology in Education Questionnaire (Part 2)		1155	987	85%	1077	843	78%
3. School Information Technology in Education Survey	School representatives /ITEd Team heads/ITCs	1155	992	86%	1077	843	78%
B. Sampled schools							
4. Information Technology in Education Team Teachers' Questionnaire	ITEd Team Teachers	858	713	83%	847	592	70%
5. Teachers' Information Technology in Education Questionnaire	Non-ITEd Team Teachers & ITEd Team Teachers	6737	4748	70%	7109	4053	57%
6. Therapists' Information Technology in Education Questionnaire	Therapists	30	25	83%	28	27	96%
7. Students' Information Technology in Education Questionnaire	1 class of P4, P6 students (primary); 1 class of S2, S4, S6 students (secondary); 1 class of P4, P6, S2 students [special schools (normal curriculum)] and 1 class of P4, S1, 1st year of EYE students [special schools (special curriculum)]	12477	10143	81%	12712	9375	74%
8. Parents' Information Technology in Education Questionnaire	Parents of selected students	12467	9501	76%	12696	8214	65%

[a] 1155: Total number of schools of the three school sectors in MS1, which included 1005 non-sampled schools (Primary =555, Secondary =399 & Special=51) and 150 sampled schools (Primary =68, Secondary =72 & Special=10).

[b] 1077: Total number of schools of the three school sectors in MS2, which included 923 non-sampled schools (Primary =477, Secondary =396 & Special=50) and 154 sampled schools (Primary =72 , Secondary =72 & Special=10).

5.4 Sampling of Community Group Interview

Focus group interviews were conducted with representatives of the selected organisations in the Community Group parallel to the data collection periods of MS1 and MS2.

Non-random sampling was adopted in the Community Group Interview. Experts and professionals in the IT and ITEd-related community, such as tertiary institutions, publishers and NGOs were invited to the focus group interviews. A list of potential candidates for the Community Group was generated and short-listed from the following sources: the list of focus group interviews in the Overall Study (EMB, 2005b), suggestions made by the EMB as well as information from online searching engines and directories. The selection of the potential candidates for the Community Group was through voting by members of the honorary advisory group and finalised by the two Principal Investigators.

Invitation documents were sent to 12 organisations from the Community Group including 5 IT-related organisations, 3 NGOs, 2 publishers and 2 tertiary institutions. Nine organisations (2 IT-related organisations, 3 NGOs, 2 publishers and 2 tertiary institutions) accepted to participate in the focus group interviews. Each of the organisations was invited to nominate 2 to 6 representatives to participate in the interview. The actual total number of representatives for the 9 focus group interviews was 30.

Chapter 6 Major Findings and Discussion for Primary School Sector

This chapter reports on the major findings and discussion of Main Study (I) (MS1) and Main Study (II) (MS2) about the progress of different ITEd implementation measures and the application of IT in primary schools with respect to the seven strategic goals of ITEd as set out in the Second ITEd Strategy (EMB, 2004):

- Empowering learners with IT
- Empowering teachers with IT
- Enhancing school leadership for the knowledge age
- Enriching digital resources for learning
- Improving IT infrastructure and pioneering pedagogy using IT
- Providing continuous research and development
- Promoting community-wide support and community building

A snap-shot of each strategic goal is presented for two intervals, namely MS1 and MS2 respectively. The data are drawn from the self-evaluation on the expected outcomes of the strategic goals by school heads and the questionnaires from different stakeholder groups which portray the current situation and the relevant implementation practices of various strategic goals in primary schools. ***The major findings are based on the results of MS1 which describe the situation of the implementation in the first stage of ITEd. The differences between the findings of MS1 and MS2 are then observed to track the progress of the implementation of ITEd from 2004/05 to 2006/07. Only items with statistically significant difference in MS2 are mentioned.***

6.1 Empowering Learners with IT

The first strategic goal of the Second ITEd Strategy is "Empowering learners with IT" which aims at fostering students with the necessary skills, knowledge and attitude for learning and problem-solving in the information age. To track the progress of this goal, the following aspects related to students' learning with IT are addressed:

- Proficiency in computing skills
- Attitude towards social and ethical issues of using IT
- Belief and attitude towards use of IT for learning
- Learning activities with IT
- Confidence in the use of IT to perform learning tasks
- Learning support
- School ITEd curriculum

6.1.1 Proficiency in Computing Skills

School heads were satisfied with students' IT knowledge and skills

Learning with IT could not be achieved until students had acquired basic knowledge and skills of IT. In MS1, 79% of school heads were satisfied or very satisfied that students could master requisite IT knowledge and apply basic concepts and skills at their related learning stages. A statistically significant increase was noted in school heads' satisfaction level (from 79% to 85%) in MS2 (Table 6.1, [P1]HSQ1a[10]).

[10] [P1] refers to questionnaire code; HSQ refers to question item number for specific stakeholder. For details of different questionnaire titles, codes and stakeholders, please refer to Table 4.1 (p.30). Detailed descriptive statistics for primary school sector for MS1 and MS2 are reported in Appendices 1.1 and 2.1 respectively.

Table 6.1 School heads' levels of satisfaction with students' proficiency in computing skills ([P1]HSQ1a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students can master requisite IT knowledge and apply basic concepts and skills at their related learning stages."									
MS1	3.86	0.53	551	39 (7)	399 (72)	108 (20)	5 (1)	0 (0)	0.019 *
MS2	3.93	0.50	445	40 (9)	338 (76)	65 (15)	2 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students were generally proficient in software and hardware skills

Students were asked to evaluate their proficiency in using software (Table 6.2, [P6]SQ16a-k). In MS1, higher percentages of the P4 and P6 students rated themselves as proficient or highly proficient in using "online communication software" (54% of P4 and 70% of P6) and "online information searching tools" (52% of P4 and 68% of P6). Lower percentages of the respondents rated themselves as proficient or highly proficient in "programming" (37% for both P4 and P6) and using "audio or video editing software" (37% of P4 and 40% of P6), with mean ratings below 3.00 (SD:1.41-1.43) for P4 and between 3.05 and 3.16 (SD:1.27-1.31) for P6 on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'.

Among the software listed in Table 6.2, a statistically significant increase was observed in MS2 in the percentages of both P4 and P6 students who rated themselves as proficient or highly proficient in using "online information searching tools" (56% of P4 and 72% of P6). A statistically significant increase was also observed in P6 students' proficiency level of using "presentation software" (from 64% to 69%) and that of P4 students in "online communication software" (from 54% to 57%) in MS2. However, a statistically significant decrease was reported in MS2 in P4 students' proficiency level of "Chinese input" (from 41% to 37%) and that of the P6 students in using "web design or editing software" (from 44% to 42%).

As for the proficiency in using hardware (Table 6.3, [P6]SQ17a-j), as reported in MS1, a higher proportion of P6 students indicated that they were proficient or highly proficient in the specific types of hardware as compared with the P4 counterparts. In general, relatively more students reported that they were proficient or highly proficient in the "keyboard" (58% of P4 and 71% of P6) and "printer" (48% of P4 and 60% of P6); followed by the use of "digital camera" (45% of P4 and 53% of P6) and "CD-ROM writer" (43% of P4 and 52% of P6). All these skills had mean ratings between 3.09 and 3.62 (SD:1.32-1.46) for P4 and 3.42 and 3.97 (SD:1.08-1.30) for P6 students respectively on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'. Around 34% to 42% of the students perceived themselves as proficient or highly proficient in using "scanner" (36% of P4 and 42% of P6) and "mobile devices" (34% of P4 and 40% of P6), with mean ratings fell in the range of 2.81 to 2.83 (SD:1.48) for P4 and 3.04 to 3.15 (SD:1.33-1.38) for P6 students on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'.

For the hardware shown in Table 6.3, a statistically significant increase was observed in the percentages of P4 and P6 students who rated themselves as proficient or highly proficient in "keyboard" (MS1: 58%-71%; MS2: 63%-75%) and that of the P6 students in using "digital camera" (from 53% to 58%) and "digital video recorder" (from 47% to 51%) in MS2.

Table 6.2 Students' self-evaluated levels of proficiency in software use ([P6]SQ16a-k)

Class levels	Software	MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all										
P4	a.	3.36	1.31	1772	430	24	418	24	523	30	164	9	237	13	3.40	1.26	1922	438	23	518	27	575	30	153	8	239	12	0.398
	b.	3.37	1.32	1770	433	24	448	25	473	27	172	10	244	14	3.37	1.30	1917	453	24	493	26	558	29	147	8	267	14	0.933
	c.	3.17	1.34	1765	364	21	369	21	537	30	195	11	300	17	3.27	1.31	1913	407	21	454	24	580	30	191	10	283	15	0.056
	d.	3.50	1.32	1767	512	29	449	25	428	24	166	9	213	12	3.65	1.26	1923	640	33	469	24	482	25	163	8	169	9	0.002**
	e.	3.50	1.31	1771	518	29	415	23	474	27	159	9	205	12	3.62	1.27	1917	618	32	460	24	514	27	137	7	188	10	0.017 *
	f.	3.03	1.41	1772	355	20	325	18	489	28	211	12	390	22	3.01	1.39	1915	343	18	400	21	524	27	230	12	418	22	0.578
	g.	3.31	1.37	1761	450	26	375	21	480	27	181	10	275	16	3.39	1.33	1915	503	26	431	23	548	29	174	9	259	14	0.241
	h.	3.00	1.45	1760	366	21	329	19	439	25	192	11	435	25	2.98	1.43	1911	353	18	390	20	513	27	175	9	480	25	0.604
	i.	2.94	1.43	1754	330	19	313	18	476	27	191	11	444	25	2.94	1.44	1915	344	18	390	20	484	25	194	10	503	26	0.951
	j.	2.96	1.41	1758	319	18	330	19	477	27	221	13	412	23	3.02	1.41	1914	365	19	388	20	506	26	220	11	434	23	0.220
	k.	3.20	1.31	1751	375	21	354	20	477	27	326	19	218	12	3.05	1.33	1912	349	18	368	19	537	28	338	18	320	17	0.000 ***
P6	a.	3.54	1.11	1944	419	22	607	31	648	33	137	7	133	7	3.61	1.04	2044	419	20	755	37	640	31	121	6	109	5	0.101
	b.	3.53	1.08	1944	373	19	671	35	634	33	142	7	125	6	3.54	1.05	2044	380	19	730	36	667	33	157	8	110	5	0.708
	c.	3.78	1.03	1940	540	28	694	36	519	27	119	6	67	3	3.89	0.95	2042	603	30	787	39	520	25	90	4	42	2	0.011*
	d.	3.98	1.04	1941	761	39	607	31	414	21	98	5	61	3	4.03	0.99	2042	797	39	701	34	409	20	85	4	50	2	0.344
	e.	3.92	1.07	1943	726	37	594	31	446	23	104	5	73	4	4.01	1.01	2046	786	38	690	34	434	21	72	4	64	3	0.046*
	f.	3.27	1.23	1945	361	19	489	25	629	32	244	13	222	11	3.17	1.25	2043	338	17	504	25	649	32	272	13	279	14	0.021*
	g.	3.53	1.14	1944	444	23	597	31	587	30	183	9	133	7	3.55	1.14	2040	475	23	616	30	637	31	172	8	140	7	0.668
	h.	3.23	1.28	1943	364	19	489	25	591	30	226	12	272	14	3.23	1.25	2036	357	18	545	27	613	30	254	12	267	13	0.971
	i.	3.05	1.31	1935	324	17	391	20	613	32	269	14	339	18	2.97	1.31	2035	292	14	427	21	655	32	252	12	409	20	0.092
	j.	3.16	1.27	1941	346	18	436	22	628	32	252	13	279	14	3.11	1.27	2038	324	16	491	24	627	31	279	14	317	16	0.324
	k.	3.42	1.22	1936	441	23	530	27	533	28	261	13	171	9	3.41	1.19	2039	456	22	543	27	565	28	338	17	136	7	0.831

Software

a. Word processing software
b. Spreadsheet
c. Presentation software
d. Online communication software (e.g. E-mail)
e. Online information searching tools (e.g. browser, search engine)
f. Web design/editing software
g. Computer graphic design (e.g. drawing and photo editing)
h. Multi-media design software (e.g. animation design)
i. Programming (e.g. Logo and Java)
j. Audio/Video editing software (e.g. editing and file format conversion)
k. Chinese input

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.3 Students' self-evaluated levels of proficiency in hardware use ([P6]SQ17a-j)

Class levels	Hardware	MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		
P4	a.	3.21	1.46	1773	454	(26)	393	(22)	358	(20)	206	(12)	362	(20)	3.18	1.48	1912	510	(27)	367	(19)	409	(21)	212	(11)	414	(22)	0.246
	b.	3.09	1.45	1776	401	(23)	359	(20)	401	(23)	220	(12)	394	(22)	3.05	1.46	1911	424	(22)	369	(19)	446	(23)	226	(12)	445	(23)	0.329
	c.	3.19	1.45	1772	451	(25)	359	(20)	389	(22)	225	(13)	348	(20)	3.21	1.48	1913	523	(27)	351	(18)	434	(23)	206	(11)	398	(21)	0.967
	d.	3.02	1.48	1777	409	(23)	314	(18)	383	(22)	248	(14)	423	(24)	2.98	1.49	1915	416	(22)	352	(18)	430	(22)	211	(11)	506	(26)	0.237
	e.	2.83	1.48	1774	338	(19)	297	(17)	384	(22)	240	(14)	515	(29)	2.77	1.49	1915	347	(18)	300	(16)	435	(23)	232	(12)	600	(31)	0.091
	f.	2.81	1.48	1768	339	(19)	263	(15)	399	(23)	255	(14)	512	(29)	2.74	1.50	1907	352	(18)	275	(14)	437	(23)	211	(11)	633	(33)	0.064
	g.	3.05	1.49	1772	435	(25)	291	(16)	395	(22)	235	(13)	416	(23)	3.01	1.51	1908	455	(24)	314	(16)	434	(23)	208	(11)	497	(26)	0.209
	h.	3.24	1.46	1770	480	(27)	352	(20)	384	(22)	214	(12)	340	(19)	3.27	1.48	1908	575	(30)	319	(17)	432	(23)	207	(11)	374	(20)	0.546
	i.	3.05	1.48	1761	422	(24)	294	(17)	393	(22)	251	(14)	402	(23)	3.03	1.49	1899	441	(23)	341	(18)	423	(22)	225	(12)	469	(25)	0.595
	j.	3.62	1.32	1757	616	(35)	399	(23)	385	(22)	177	(10)	180	(10)	3.83	1.22	1902	770	(40)	439	(23)	424	(22)	147	(8)	122	(6)	0.000 ***
P6	a.	3.63	1.24	1942	573	(30)	590	(30)	437	(23)	168	(9)	173	(9)	3.67	1.24	2036	624	(31)	630	(31)	464	(23)	120	(6)	197	(10)	0.282
	b.	3.42	1.28	1944	471	(24)	545	(28)	496	(26)	202	(10)	231	(12)	3.41	1.32	2038	512	(25)	554	(27)	497	(24)	202	(10)	272	(13)	0.884
	c.	3.48	1.30	1944	530	(27)	512	(26)	485	(25)	196	(10)	221	(11)	3.61	1.27	2035	617	(30)	578	(28)	470	(23)	164	(8)	206	(10)	0.003**
	d.	3.25	1.34	1942	422	(22)	482	(25)	510	(26)	221	(11)	307	(16)	3.36	1.35	2033	502	(25)	523	(26)	518	(25)	179	(9)	311	(15)	0.004**
	e.	3.15	1.33	1943	377	(19)	441	(23)	538	(28)	275	(14)	313	(16)	3.11	1.38	2034	393	(19)	473	(23)	540	(27)	213	(10)	414	(20)	0.821
	f.	3.04	1.38	1938	356	(18)	423	(22)	505	(26)	259	(13)	396	(20)	3.00	1.39	2032	349	(17)	455	(22)	540	(27)	224	(11)	464	(23)	0.649
	g.	3.39	1.32	1943	479	(25)	518	(27)	492	(25)	193	(10)	260	(13)	3.39	1.34	2035	526	(26)	520	(26)	512	(25)	184	(9)	294	(14)	0.599
	h.	3.58	1.28	1938	583	(30)	524	(27)	450	(23)	191	(10)	189	(10)	3.57	1.31	2037	634	(31)	529	(26)	471	(23)	169	(8)	234	(11)	0.891
	i.	3.44	1.29	1939	503	(26)	496	(26)	525	(27)	193	(10)	223	(12)	3.44	1.32	2026	540	(27)	525	(26)	518	(26)	180	(9)	263	(13)	0.752
	j.	3.97	1.08	1935	762	(39)	616	(32)	377	(19)	106	(5)	75	(4)	4.10	0.99	2028	881	(43)	651	(32)	365	(18)	84	(4)	46	(2)	0.003 **

Hardware

a. Printer
b. CD-ROM (CD-R or DVD-R) Writer
c. Digital Camera
d. Digital Video Recorder
e. Scanner
f. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)]
g. Network Devices (e.g. Domestic Network Devices)
h. Portable Computer Game Devices
i. Portable Multi-media Player Devices
j. Use of Keyboard

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.1.2 Attitude towards Social and Ethical Issues of Using IT

School heads tended to be satisfied with students' attitude towards social and ethical issues of using IT — a statistically significant increase was noted in MS2

Regarding students' attitude towards social and ethical issues of using IT, 58% of school heads in MS1 were satisfied or very satisfied that students agreed that the use of IT should comply with ethical and moral standard as set out in society. A statistically significant increase to 67% was observed in MS2 (Table 6.4, [P1]HSQ1g).

Table 6.4 School heads' levels of satisfaction with students' attitude towards social and ethical issues of using IT ([P1]HSQ1g)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students agree that the use of IT should comply with ethical and moral standard as set out in society."									
MS1	3.61	0.64	551	29 (5)	293 (53)	212 (38)	17 (3)	0 (0)	0.003**
MS2	3.73	0.59	445	30 (7)	268 (60)	144 (32)	3 (1)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students generally showed awareness of social and ethical issues of using IT

The appropriateness of students' attitude towards using IT can be measured by students' views towards the social and ethical issues in various computer-related activities. Students generally show themselves as responsible users of IT. The responses, shown in Table 6.5 ([P6]SQ20a-f), illustrate that there is a reasonable level of awareness of social and ethical issues relating to the use of IT. In MS1, more than 51% of the students showed positive attitude towards the following social and ethical issues in using IT: "beware of e-mail bombs or the spread of computer virus" (rated as agreed or strongly agreed by 61% of P4 and 65% of P6) and "avoid spending long hours on computer or online games" (rated as agreed or strongly agreed by 56% of P4 and 52% of P6). The mean ratings fell in the range of 3.64 to 3.70 (SD:1.33-1.46) for P4 and 3.52 to 3.90 (SD:1.25-1.29) for P6 students on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. Higher awareness was recorded in MS2 for the above two social and ethical issues. The percentages increased to 69% of P4 and 73% of P6 for the first one as well as 62% of P4 and 57% of P6 for the second one.

In MS1, more than 57% of the respondents disagreed or strongly disagreed on improper social and ethical activities related to the use of IT: "surfing pornographic websites" (65% of P4 and 68% of P6), "using pirated software" (63% of P4 and 58% of P6) and "disclosing personal particulars to strangers online" (64% of P4 and 66% of P6). The mean ratings fell in the range of 2.12 to 2.18 (SD:1.46-1.49) for P4 and 2.00 to 2.25 (SD:1.36-1.38) for P6 students on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. A statistically significant increase was observed in the percentages of P6 students disagreeing or strongly disagreeing these issues in MS2 (MS1: 58%-68%; MS2: 61%-71%).

On the other hand, in MS1, less than 41% of the students (38% of P4 and 40% of P6) disagreed or strongly disagreed on "sending or forwarding unnecessary e-mails or messages", with mean ratings of 3.01 (SD:1.55) and 2.90 (SD:1.49) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. A statistically significant decrease to 35% was recorded in this issue for P4 in MS2 (Table 6.5, [P6]SQ20a-f).

Table 6.5 Students' attitude towards social and ethical issues related to the use of IT ([P6]SQ20a-f)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Strongly agree		Agree		Neutral		Disagree		Strongly disagree				Strongly agree		Agree		Neutral		Disagree		Strongly disagree		
P4	a.	3.64	1.33	1778	657	(37)	337	(19)	467	(26)	118	(7)	200	(11)	3.80	1.28	1917	790	(41)	407	(21)	438	(23)	110	(6)	173	(9)	0.000***
	b.	3.70	1.46	1776	809	(46)	269	(15)	321	(18)	115	(6)	262	(15)	3.92	1.40	1906	997	(52)	322	(17)	268	(14)	75	(4)	243	(13)	0.000***
	c.	3.01	1.55	1775	472	(27)	223	(13)	410	(23)	181	(10)	488	(28)	3.18	1.60	1907	605	(32)	312	(16)	318	(17)	160	(8)	511	(27)	0.003**
	d.	2.13	1.49	1776	243	(14)	124	(7)	260	(15)	140	(8)	1008	(57)	2.27	1.59	1913	331	(17)	184	(10)	227	(12)	108	(6)	1062	(56)	0.113
	e.	2.18	1.46	1772	229	(13)	143	(8)	286	(16)	181	(10)	933	(53)	2.32	1.57	1907	332	(17)	173	(9)	260	(14)	158	(8)	983	(52)	0.088
	f.	2.12	1.46	1769	225	(13)	119	(7)	284	(16)	148	(8)	992	(56)	2.27	1.59	1895	326	(17)	177	(9)	222	(12)	133	(7)	1037	(55)	0.070
P6	a.	3.52	1.25	1934	543	(28)	459	(24)	586	(30)	157	(8)	189	(10)	3.64	1.22	2038	618	(30)	545	(27)	569	(28)	127	(6)	179	(9)	0.003**
	b.	3.90	1.29	1934	918	(47)	352	(18)	400	(21)	92	(5)	173	(9)	4.08	1.21	2034	1077	(53)	414	(20)	333	(16)	57	(3)	153	(8)	0.000***
	c.	2.90	1.49	1936	420	(22)	267	(14)	478	(25)	238	(12)	533	(28)	2.86	1.56	2039	477	(23)	278	(14)	413	(20)	231	(11)	641	(31)	0.529
	d.	2.00	1.38	1936	198	(10)	107	(6)	322	(17)	173	(9)	1137	(59)	1.94	1.42	2039	236	(12)	119	(6)	238	(12)	146	(7)	1300	(64)	0.009**
	e.	2.25	1.36	1935	200	(10)	146	(8)	454	(23)	280	(14)	856	(44)	2.19	1.41	2032	235	(12)	142	(7)	405	(20)	250	(12)	1000	(49)	0.032*
	f.	2.07	1.36	1932	187	(10)	125	(6)	345	(18)	245	(13)	1030	(53)	2.02	1.42	2029	244	(12)	113	(6)	272	(13)	211	(10)	1189	(59)	0.019*

Social and ethical issues related to the use of IT

a. Avoid spending long hours on computer/online games
b. Beware of E-mail bombs or the spread of computer virus
c. Sending/forwarding unnecessary E-mails/messages
d. Surfing pornographic websites
e. Using pirated (reproduced) software
f. Disclosing personal particulars to strangers online

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.1.3 Belief and Attitude towards Use of IT for Learning

School heads were satisfied with students' positive attitude towards using IT for learning

90% of school heads were satisfied or very satisfied that students possessed positive attitude towards using IT in their learning in MS1. No statistically significant difference was observed in MS2 (Table 6.6, [P1]HSQ1b).

Table 6.6 School heads' levels of satisfaction with students' belief and attitude towards the use of IT for learning ([P1]HSQ1b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students possess positive attitude towards using IT in their learning."									
MS1	4.07	0.54	551	97 (18)	399 (72)	52 (9)	3 (1)	0 (0)	0.141
MS2	4.12	0.49	445	83 (19)	335 (75)	26 (6)	1 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students, teachers and parents perceived that IT had positive impact on learning

Regarding the perceived impact of IT on students' learning outcomes, students, teachers and parents showed very positive perception of learning with IT. Students' levels of agreement on their learning outcome as derived from learning with IT is depicted in Table 6.7 ([P6]SQ15a.i-ix). It was found that P4 and P6 students had different perception of this aspect in MS1. The perceived outcomes which were agreed or strongly agreed by slightly less than two-thirds of the surveyed students were "enhance interest in self-learning of subject content" for P4 students (60%) and "widen perspective through interaction with the outside world" for P6 students (57%). The mean ratings of the above items were 3.78 (SD:1.04) and 3.72 (SD:1.01) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. The P4 students rated themselves more highly than the P6 students on all aspects except for the benefit of widening perspective through more interaction with the outside world. 56% of P4 and 57% of P6 agreed or strongly agreed to this issue. 52% of P4 and 47% of P6 students agreed or strongly agreed to the effect of using IT to "enhance communication and presentation skills", with mean ratings of 3.57 (SD:1.11) and 3.50 (SD:0.98) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. A statistically significant increase was found in all learning outcomes for P4 (MS1: 52%-60%; MS2: 61%-67%) in MS2. All learning outcomes had a statistically significant increase for P6 (MS1: 48%-57%; MS: 53%-60%) except for the outcomes of "enhance interest in self-learning of subject content" and "enhance communication and presentation skills".

Teachers' perception of outcomes as derived from students' learning with IT is depicted in Table 6.8 ([P5]TQ15a-i). In MS1, about 80% of the teachers agreed or strongly agreed that learning with IT could enhance students' self-learning interest of subject content (82%) as well as widen students' perspective through more interaction with the outside world (81%). In addition, teachers agreed or strongly agreed that IT could strengthen students' understanding of the subject content (75%) and enhance information processing ability (73%). Around 50% of the teachers agreed or strongly agreed that IT could enhance students' planning and learning management skills (52%) as well as creativity (51%) and academic performance (48%). 47% of the teachers agreed or strongly agreed that IT could provide opportunities for collaborative learning. On the other hand, 39% of the teachers agreed or strongly agreed that IT could enhance students' communication and presentation skills. A statistically significant increase was noted in the percentages of teachers who agreed or strongly agreed with the following learning outcomes of using IT for students in MS2: "provide opportunities for collaborative learning" (from 47% to 51%), "enhance academic performance" (from 48% to 51%), "enhance communication and presentation skills" (from 39% to 43%) and "enhance planning and learning management skills" (from 52% to 54%).

Table 6.9 ([P7]PQ5a-f) presents the parents' belief of the impact of IT on the learning outcomes. In MS1, relatively high percentages of the parents agreed or strongly agreed to the following learning outcomes as derived from their children's learning with IT: "provide rich learning resources to your child for learning" (70%), "widen your child's perspective through more interaction with the outside world" (66%) and "enhance your child's interest in self-learning of subject matter" (59%). The items which were rated at or below 50% were "provide collaborative learning opportunities for your child" (50%), "enhance your child's academic performance" (48%) and "enhance your child's communication and presentation skills" (43%). In MS2, a statistically significant decrease was observed in providing rich learning resources to their children for learning (from 70% to 69%) and enhancing their children's interest in self-learning of subject matter (from 59% to 56%).

Table 6.7 Students' levels of agreement to their learning outcomes as derived from learning with IT ([P6]SQ15a.i-ix)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Strongly agree		Agree		Neutral		Disagree		Strongly disagree				Strongly agree		Agree		Neutral		Disagree		Strongly disagree		
P4	i.	3.78	1.07	1781	563	(32)	489	(27)	578	(32)	70	(4)	80	(4)	3.91	0.99	1934	645	(33)	634	(33)	542	(28)	60	(3)	53	(3)	0.001**
	ii.	3.72	1.02	1776	459	(26)	581	(33)	593	(33)	70	(4)	73	(4)	3.86	0.94	1927	548	(28)	715	(37)	560	(29)	61	(3)	43	(2)	0.000***
	iii.	3.78	1.04	1780	521	(29)	552	(31)	571	(32)	61	(3)	75	(4)	3.92	0.96	1923	627	(33)	663	(34)	526	(27)	67	(4)	40	(2)	0.000***
	iv.	3.67	1.05	1779	472	(27)	496	(28)	647	(36)	87	(5)	78	(4)	3.80	0.98	1920	538	(28)	651	(34)	586	(31)	98	(5)	47	(2)	0.000***
	v.	3.63	1.07	1777	450	(25)	498	(28)	635	(36)	109	(6)	85	(5)	3.82	1.00	1923	564	(29)	648	(34)	577	(30)	72	(4)	62	(3)	0.000***
	vi	3.68	1.10	1772	496	(28)	499	(28)	573	(32)	118	(7)	86	(5)	3.83	1.04	1924	611	(32)	610	(32)	527	(27)	115	(6)	61	(3)	0.000***
	vii	3.57	1.11	1778	438	(25)	473	(27)	629	(35)	140	(8)	98	(6)	3.76	1.06	1918	560	(29)	612	(32)	556	(29)	116	(6)	75	(4)	0.000***
	viii	3.65	1.11	1774	493	(28)	481	(27)	589	(33)	114	(6)	98	(6)	3.80	1.05	1916	579	(30)	635	(33)	523	(27)	101	(5)	78	(4)	0.000***
	ix.	3.69	1.13	1770	538	(30)	459	(26)	558	(32)	117	(7)	98	(6)	3.85	1.07	1911	636	(33)	601	(31)	501	(26)	92	(5)	81	(4)	0.000***
P6	i.	3.56	0.97	1940	368	(19)	584	(30)	820	(42)	98	(5)	69	(4)	3.64	0.92	2053	406	(20)	685	(33)	835	(41)	79	(4)	49	(2)	0.005**
	ii.	3.61	0.92	1940	344	(18)	698	(36)	763	(39)	74	(4)	60	(3)	3.72	0.88	2048	408	(20)	792	(39)	746	(36)	61	(3)	41	(2)	0.001**
	iii.	3.66	0.94	1942	398	(20)	690	(36)	716	(37)	81	(4)	57	(3)	3.74	0.90	2049	437	(21)	790	(39)	710	(35)	74	(4)	39	(2)	0.053
	iv.	3.53	0.92	1937	309	(16)	613	(32)	868	(45)	87	(4)	60	(3)	3.62	0.90	2049	370	(18)	720	(35)	812	(40)	107	(5)	40	(2)	0.002**
	v.	3.58	0.93	1941	325	(17)	681	(35)	790	(41)	80	(4)	65	(3)	3.68	0.91	2049	408	(20)	755	(37)	757	(37)	88	(4)	41	(2)	0.001***
	vi	3.58	0.99	1941	384	(20)	629	(32)	739	(38)	113	(6)	76	(4)	3.66	0.96	2049	436	(21)	702	(34)	737	(36)	121	(6)	53	(3)	0.021*
	vii	3.50	0.98	1939	335	(17)	584	(30)	806	(42)	141	(7)	73	(4)	3.55	1.00	2050	396	(19)	635	(31)	791	(39)	159	(8)	69	(3)	0.113
	viii	3.60	0.99	1936	385	(20)	645	(33)	715	(37)	121	(6)	70	(4)	3.68	0.96	2042	446	(22)	709	(35)	727	(36)	105	(5)	54	(3)	0.021*
	ix	3.72	1.01	1933	509	(26)	599	(31)	661	(34)	101	(5)	62	(3)	3.78	1.00	2034	575	(28)	653	(32)	652	(32)	94	(5)	59	(3)	0.047*

Students' learning outcomes as derived from learning with IT

i. Enhance academic performance
ii. Strengthen understanding of subject knowledge
iii. Enhance interest in self-learning of subject content
iv. Enhance planning and learning management skills
v. Enhance information processing ability
vi. Enhance creativity
vii. Enhance communication and presentation skills
viii. Provide opportunities for collaborative learning
ix. Widen perspective through more interaction with the outside world

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.8 Teachers' levels of agreement to students' learning outcomes as derived from learning with IT ([P5]TQ15a-i)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Strongly agree		Agree		Neutral		Disagree											
a.	3.42	0.65	1825	32	(2)	832	(46)	843	(46)	110 (6)	8 (0)	3.49	0.65	1799	59	(3)	862	(48)	793	(44)	79 (4)	6 (0)	0.003**
b.	3.77	0.57	1828	90	(5)	1277	(70)	424	(23)	33 (2)	4 (0)	3.79	0.58	1799	113	(6)	1236	(69)	420	(23)	26 (1)	4 (0)	0.404
c.	3.92	0.58	1825	208	(11)	1304	(71)	286	(16)	22 (1)	5 (0)	3.92	0.58	1799	213	(12)	1250	(69)	317	(18)	16 (1)	3 (0)	0.563
d.	3.48	0.67	1826	48	(3)	898	(49)	766	(42)	104 (6)	10 (1)	3.53	0.67	1798	76	(4)	896	(50)	733	(41)	85 (5)	8 (0)	0.049*
e.	3.77	0.61	1827	124	(7)	1205	(66)	452	(25)	43 (2)	3 (0)	3.80	0.60	1796	136	(8)	1195	(67)	433	(24)	28 (2)	4 (0)	0.209
f.	3.44	0.71	1825	51	(3)	880	(48)	738	(40)	140 (8)	16 (1)	3.48	0.72	1798	87	(5)	838	(47)	742	(41)	122 (7)	9 (1)	0.236
g.	3.23	0.79	1824	47	(3)	658	(36)	830	(46)	253 (14)	36 (2)	3.31	0.78	1798	66	(4)	693	(39)	798	(44)	219 (12)	22 (1)	0.006**
h	3.36	0.76	1825	48	(3)	803	(44)	752	(41)	197 (11)	25 (1)	3.44	0.74	1797	70	(4)	843	(47)	708	(39)	163 (9)	13 (1)	0.002**
i.	3.93	0.66	1827	284	(16)	1189	(65)	311	(17)	35 (2)	8 (0)	3.90	0.66	1795	246	(14)	1172	(65)	331	(18)	39 (2)	7 (0)	0.078

Students' learning outcomes as derived from their learning with IT

a. Enhance academic performance
b. Strengthen understanding of the subject content
c. Enhance self-learning and interest in learning the subject content
d. Enhance planning and learning management skills
e. Enhance information processing ability
f. Enhance creativity
g. Enhance communication and presentation skills
h. Provide opportunities for collaborative learning
i. Widen perspective through more interaction with the outside world

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.9 Parents' levels of agreement on the learning outcomes as derived from students' learning with IT ([P7]PQ5a-f)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Strongly agree		Agree		Neutral		Disagree											
a.	3.81	0.71	3309	494	(15)	1830	(55)	898	(27)	78 (2)	9 (0)	3.79	0.70	3607	467	(13)	2024	(56)	1021	(28)	84 (2)	11 (0)	0.008**
b.	3.50	0.81	3273	338	(10)	1259	(38)	1367	(42)	282 (9)	27 (1)	3.46	0.79	3599	298	(8)	1425	(40)	1536	(43)	317 (9)	23 (1)	0.184
c.	3.63	0.78	3276	328	(10)	1611	(49)	1110	(34)	207 (6)	21 (1)	3.56	0.79	3592	328	(9)	1681	(47)	1295	(36)	261 (7)	27 (1)	0.007**
d.	3.36	0.89	3264	259	(8)	1159	(35)	1330	(41)	455 (14)	62 (2)	3.30	0.89	3595	260	(7)	1270	(35)	1414	(39)	580 (16)	70 (2)	0.136
e.	3.46	0.86	3256	282	(9)	1345	(41)	1214	(37)	369 (11)	47 (1)	3.45	0.84	3597	290	(8)	1514	(42)	1351	(38)	392 (11)	50 (1)	0.973
f.	3.73	0.83	3266	472	(14)	1689	(52)	868	(27)	204 (6)	33 (1)	3.70	0.81	3578	467	(13)	1865	(52)	981	(27)	231 (6)	33 (1)	0.154

Learning outcomes as derived from students' learning with IT

a. Provide rich learning resources to your child for learning
b. Enhance your child's academic performance
c. Enhance your child's interest in self-learning of subject matter
d. Enhance your child's communication and presentation skills
e. Provide collaborative learning opportunities for your child
f. Widen your child's perspective through more interaction with the outside world

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students liked to use computers for learning

As far as the acceptance of using IT as a tool for learning was concerned, students liked to use computers for learning. 84% to 89% of primary school students liked to use computers for learning in class or beyond school hours in MS1 (Tables 6.10 and 6.11, [P6]SQ3a,11e). A statistically significant increase was noted in the percentages of P4 (from 89% to 90%) and P6 (from 86% to 87%) who liked using computers for learning in class in MS2. No significance difference was noted in the percentages of students who liked using computers for learning beyond school hours in MS2.

The reasons that students liked or did not like using IT for learning in class are presented in Table 6.10 ([P6]SQ3b.ii,c). In MS1, the major reason that students liked to use computers for learning in class was to enhance learning interest. A statistically significant increase was noted in the percentages of both P4 (from 49% to 52%) and P6 (52% to 56%) for this reason in MS2. The reason "can use the computer by yourself" was significant decreased from 39% to 37% for P6. Similarly, the reason "can use computers in small groups" also showed a statistically significant decrease for both P4 (from 9% to 6%) and P6 (from 10% to 8%). The major reason that students did not like to use computers for learning in class was largely due to the restriction from teachers in their use of computers. There was a statistically significant decrease in P6 for this item (from 67% to 52%) in MS2.

Students tended to be willing in using IT for learning

Students' attitude towards the use of IT in learning process is reflected by their interest in exploring innovative IT hardware and software and also by their willingness to allocate more time in using IT for learning. When students were asked about their interest in using innovative IT tools, techniques and applications, nearly two-thirds of the students showed interest in new technology. In MS1, 60% of P4 and 64% of P6 students were interested or very interested in the use of emerging innovative IT tools, techniques and applications, with mean ratings of 3.77 (SD:1.07) and 3.84 (SD:0.99) respectively on a scale of 1 to 5 where 1 was 'not interested at all' and 5 was 'very interested' ([P6]SQ21). When students were further asked to indicate their willingness to allocate more time in using IT for learning, 57% of P4 and 59% of P6 students reported that they were willing or very willing to do so in MS1, with mean ratings of 3.72 (SD:1.03) and 3.73 (SD:0.97) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing' ([P6]SQ22). There was no statistically significant difference in this area in MS2 (Table 6.12, [P6]SQ21,22).

Table 6.10 Whether students liked to use computers for learning in class and the reasons they liked or did not like to use computer for learning in class ([P6]SQ3a,b.ii,c)

Students liked to use the computers for learning in class	**Percentage (%) choosing the option**					
	P4		***P*-value**	**P6**		***P*-value**
	MS1 (N=1788)	**MS2 (N=1957)**		**MS1 (N=1950)**	**MS2 (N=2054)**	
YES	89	90	0.000***	86	87	0.000***
NO	11	10		14	13	
	(N=1585)	**(N=1755)**		**(N=1676)**	**(N=1797)**	
Reasons students liked to use computers for learning in class						
Enhance learning interest	49	52	0.044*	52	56	0.029*
Can use the computer by yourself	41	41	0.748	39	37	0.042*
Teachers' explanation and demonstration become more vivid and clear by using computers	35	37	0.163	42	44	0.100
Can use computers in small groups	9	6	0.008**	10	8	0.010**
Other reasons	16	17	0.575	14	15	0.082
Reasons students did not like to use computer for learning in class	**(N=203)**	**(N=202)**		**(N=275)**	**(N=257)**	
Teachers restrict our use of computers	50	47	0.724	67	52	0.000***
Do not know how to use computers	17	12	0.240	11	11	0.538
Insufficient number of computers	17	14	0.556	11	10	0.740
Other reasons	30	30	0.938	24	32	0.104

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.11 Whether students liked to use computers for learning beyond school hours ([P6]SQ11e)

Students liked to use the computers for learning beyond school hours	Percentage (%) choosing the option					
	P4		*P*-value	P6		*P*-value
	MS1 (N=1745)	MS2 (N=1786)		MS1 (N=1892)	MS2 (N=1854)	
YES	86	85	0.579	84	82	0.275
NO	14	15		16	18	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.12 Students' interest in the use of emerging innovative IT tools, techniques and applications as well as their willingness to allocate more time in using IT for learning ([P6]SQ21,22)

Class levels	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very interested		Interested		Quite interested (一般)	Not interested	Not interested at all				Very interested		Interested		Quite interested (一般)	Not interested	Not interested at all	
Levels of interest in the use of emerging innovative IT tools, techniques and applications Mean: 1="Not interested at all" and 5="Very interested"																					
P4	3.77	1.07	1747	527	(30)	530	(30)	535 (31)	73 (4)	84 (5)	3.82	1.01	1890	551	(29)	661	(35)	533 (28)	80 (4)	66 (3)	0.282
P6	3.84	0.99	1938	571	(29)	675	(35)	557 (29)	82 (4)	54 (3)	3.84	0.96	2030	574	(28)	746	(37)	582 (29)	75 (4)	53 (3)	0.572

Class levels	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very willing		Willing		Maybe (一般)	Not very willing (不願意)	Totally not willing				Very willing		Willing		Maybe (一般)	Not very willing (不願意)	Totally not willing	
Levels of willingness to allocate more time in using IT for learning Mean: 1="Totally not willing" and 5="Very willing"																					
P4	3.72	1.03	1755	463	(26)	552	(31)	588 (33)	84 (5)	68 (4)	3.73	1.03	1897	487	(26)	654	(34)	599 (32)	74 (4)	83 (4)	0.620
P6	3.73	0.97	1926	477	(25)	648	(34)	662 (34)	89 (5)	50 (3)	3.72	0.96	2028	466	(23)	725	(36)	690 (34)	87 (4)	59 (3)	0.949

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.1.4 Learning Activities with IT

Students spent more time on using computers at home than in school

The extent to which students use computers for learning is reflected by the frequency in which they use computers in school and after school. Students were asked about the amount of time they spent per day on using computers in school, at home or in other places during the week prior to the conduct of the questionnaire survey. Tables 6.13 ([P6]SQ7g) and 6.14 ([P6]SQ8f) showed that primary school students spent more time on computers at home than in school. In MS1, excluding the students who did not use computers in school, at home or in other places during the week prior to the conduct of the questionnaire survey, 58% or above of the students (58% of P4 and 67% of P6) spent less than 2 hours per day in school and 51% or less of the students (51% of P4 and 40% of P6) spent less than 2 hours per day at home. The percentages of students spending 2 to less than 5 hours on using computers per day at home (22% of P4 and 28% of P6) were nearly twice the percentages of students spending 2 to less than 5 hours on using computers per day in school (14% of P4 and 12% of P6). The average number of hours that P6 students used computers per day in school, at home or in other places significantly decreased statistically (from 20% to 16% reported spending 2 hours or above in school and from 55% to 51% spending 2 hours or above at home or in other places) in MS2.

Table 6.13 Average number of hour(s) that students spent per day on using computers (during lessons and after school) in school during the week prior to the conduct of the questionnaire survey ([P6]SQ7g)

Average number of hour(s)	Percentage (%) choosing the option							
	P4		χ^2 (df=4)	*P*-value	P6		χ^2 (df=4)	*P*-value
	MS1 (N=1783)	MS2 (N=1953)			MS1 (N=1945)	MS2 (N=2058)		
10 hours or more	4	3			3	2		
5 to less than 10 hours	6	6			5	4		
2 to less than 5 hours	14	12	8.36	0.079	12	10	10.81	0.0288*
less than 2 hours	58	59			67	68		
Nil	18	21			14	16		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.14 Average number of hour(s) that students spent per day on using computers at home/other places during the week prior to the conduct of the questionnaire survey ([P6]SQ8f)

Average number of hour(s)	Percentage (%) choosing the option							
	P4		χ^2 (df=4)	*P*-value	P6		χ^2 (df=4)	*P*-value
	MS1 (N=1787)	MS2 (N=1944)			MS1 (N=1949)	MS2 (N=2049)		
10 hours or more	7	7			12	9		
5 to less than 10 hours	11	10			15	13		
2 to less than 5 hours	22	23	1.00	0.906	28	29	15.55	0.004**
less than 2 hours	51	50			40	43		
Nil	10	10			5	6		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Students were given the opportunities to use computers in class other than Computer or IT lessons

When students were asked about their usage of computers in school, the data revealed that primary school students were given the opportunities to use computers in class, other than in specific computer lessons. In MS1, over 64% of the students (65% of P4 and 71% of P6) reported that computers were used for learning 1 to 10 times in class. About 20% of the students (21% of P4 and 20% of P6) reported using computers 11 times or more during the week prior to the conduct of the questionnaire survey. A statistically significant difference was found in the frequency of P4 students using computers for learning in class (from 4% to 6% of P4 students reported using

computers 21 to 30 times and from 65% to 67% using computers 1 to 10 times) whereas there was no statistically significant difference for P6 in MS2 (Table 6.15, [P6]SQ1).

Table 6.15 Other than Computer/IT lessons, the frequency of students' use of computers for learning (including teachers' use of computers for teaching) in class during the week prior to the conduct of the questionnaire survey ([P6]SQ1)

Frequency	Percentage (%) choosing the option							
	P4		χ^2 (df=4)	*P*-value	P6		χ^2 (df=4)	*P*-value
	MS1 (N=1789)	MS2 (N=1961)			MS1 (N=1950)	MS2 (N=2060)		
31 times or more	4	3			4	3		
21 to 30 times	4	6			4	3		
11 to 20 times	13	11	14.48	0.006**	12	13	9.26	0.055
1 to 10 times	65	67			71	71		
Nil	14	13			9	10		

Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

Computers were used the most frequently in language subjects

When looking at the subjects (excluding Computer/IT) which computers were used the most frequently in class during the week prior to the conduct of the questionnaire survey, the most frequently reported subjects in MS1 was "Chinese Language" (28% for P4 and 25% for P6 students). The next most frequently reported subjects were "English Language" (18% for P4 and 12% for P6 students) and "General Studies" (13% for P4 and 19% for P6 students). Less than 10% of the respondents indicated that computers were frequently used in the other listed subjects. A statistically significant increase was noted in the percentages of students who chose "English Language" (MS1: 12%-18%; MS2: 15%-20%) and "General Studies" (MS1: 13%-19%; MS2: 16%-21%) in MS2 whereas a statistically significant decrease in the percentages of students choosing "Chinese Language" (MS1: 25%-28%; MS2: 20%-21%) was reported in MS2 (Table 6.16, [P6]SQ2a).

Table 6.16 Subjects (excluding Computer/IT lessons) which computers were used the most frequently in class during the week prior to the conduct of the questionnaire survey as reported by primary school students ([P6]SQ2a)

Subjects	Percentage (%) of Students choosing the option							
	P4				P6			
	MS1 (N=1543)	MS2 (N=1699)	χ^2 (df=10)	*P*-value	MS1 (N=1775)	MS2 (N=1858)	χ^2 (df=10)	*P*-value
Chinese Language	28	20			25	21		
English Language	18	20			12	15		
General Studies	13	16			19	21		
Mathematics	9	8			7	7		
Library/Reading	5	3			5	3		
Art and Craft	3	2	53.46	0.000***	2	2	48.90	0.000***
Physical Education	3	3			2	2		
Music	1	2			1	1		
Putonghua	1	2			2	1		
Religious Studies	1	1			0	0		
Others	17	22			25	28		

Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

Learning activities in school with the use of IT were mainly confined to information search

Students were asked about the frequency that they were required to use IT in subject-based and cross-curricular project-based learning activities in school (Table 6.17, [P6]SQ4a-e). In MS1, 39% of P4 and 54% of P6 students frequently or very frequently used computers for "information search". The mean ratings of the item for P4 and P6 students were 3.22 (SD:1.27) and 3.64 (SD:1.09) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. Except for the item of "self-evaluation on learning outcomes" (35% of P4 and 32% of P6), higher percentages of P6 than P4 students reported using IT to accomplish the other listed learning activities frequently or very frequently. A relatively lower proportion of P4 and P6 students (26%

of P4 and 33% of P6) reported using IT frequently or very frequently in "information collation and analysis", with mean ratings of 2.69 (SD:1.30) and 3.03 (SD:1.16) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. No statistically significant difference was noted in MS2.

Around half of the students used digital resources for learning beyond school hours

Apart from the learning activities in school, it is worthwhile to know the practice and the kind of digital learning resources that students have made use of beyond school hours. These learning activities allow students to learn independently and to extend their learning opportunities according to their individuals' learning needs and pace. Primary school students were asked to indicate the frequency in which their teachers assigned them to use digital resources to learn subject knowledge beyond school hours. 11% of P4 and 10% of P6 respondents indicated that their teachers did not assign any digital resources for their learning beyond school hours. Nonetheless, 55% of P4 and 60% of P6 students used digital resources assigned by their teachers (Table 6.18, [P6]SQ10a). Among them, 77% of P4 and 84% of P6 students were asked to use the designated digital resources 1 to 10 times while 13% of P4 and 9% of P6 respondents reported that their teachers assigned digital resources 11 times or more during the week prior to the conduct of the questionnaire survey (Table 6.18, [P6]SQ10b). There was a statistically significant decrease from 60% to 54% of P6 students in using digital resources assigned by teachers beyond school hours in MS2.

Other than teachers' assignments, 55% of P4 and 59% of P6 students took the initiative to make use of digital resources for self-learning beyond school hours (Table 6.18, [P6]SQ11a). Among these students, 76% of P4 and 82% of P6 students used digital resources 1 to 10 times while 16% of P4 and 13% of P6 respondents reported that they used digital resources 11 times or more during the week prior to the conduct of the questionnaire survey (Table 6.18, [P6]SQ11b). A statistically significant decrease was observed in the percentages of P4 (from 55% to 52%) and P6 students (from 59% to 49%) who used digital resources on their own initiative for self-learning beyond school hours in MS2. No statistically significant difference was noted in the frequency of their usage.

6.1.5 Confidence in the Use of IT to Perform Learning Tasks

Information literacy refers to the mastery of software or hardware skills as well as information-processing skills and attitude towards the use of IT (EMB, 2005a). Mastery of information literacy enables our students to develop necessary generic skills for lifelong learning. They include collaboration skills, communication skills, creativity, critical thinking skills, problem-solving skills, self-management skills, study skills, information skills and numeracy skills. These are the fundamental skills for learning which can be developed through the use of IT in different subjects or key learning areas (KLAs), and are transferable to different learning situations.

School heads tended to be satisfied with student's confidence in using IT for learning

With respect to students' confidence in the use of IT for learning, school heads tended to be satisfied with the items listed in Table 6.19 ([P1]HSQ1c-f). In MS1, 51% to 59% of school heads were satisfied or very satisfied that students showed the ability to use IT for independent learning, information retrieval and evaluation as well as problem-solving in their daily lives and as a tool in their learning activities. A statistically significant increase was noted in the percentages of school heads (MS1: 51%-59%; MS2: 58%-71%) who rated satisfied or very satisfied with all listed items about students' use of IT for learning in MS2.

Students were generally confident in using IT for computing tasks

Students' levels of confidence in using IT to perform respective computing tasks are shown in Table 6.20 ([P6]SQ19a-j). In MS1, 57% to 70% of the students rated themselves as confident or very confident in "English input via the computer" (66% of P4 and 70% of P6), "searching for information on the Internet" (57% of P4 and 70% of P6) and "using the computer for daily activities such as reading online newspapers" (57% of P4 and 66% of P6). The mean values ranged from 3.67 to 3.86 (SD:1.18-1.22) for P4 and 3.92 to 4.01 (SD: 1.02-1.04) for P6 on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. In other listed learning tasks except for the item of using computer to conduct entertaining activities, 53% or less of P4 and 60% or less of P6 students reported themselves as confident or very confident in other tasks such as "Chinese input" (53% of P4 and 54% of P6), "using the computer for learning" (51% of P4 and 56% of P6), "using computer to store or retrieve digital resources" (51% of P4 and 60% of P6) as well as using the Internet or other digital resources to conduct "learning activities assigned by teachers" or "self-learning activities" (50%-52% of P4 and 56% of P6). Among various tasks listed in the table, lower percentages of the students (48% of P4 and 49% of P6) indicated that they were 'confident' or 'very confident' in "using e-learning platform to conduct learning activities", with a mean rating of 3.38 (SD:1.32) and 3.49 (SD:1.17) respectively on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'.

A statistically significant decrease was found in the percentage of P4 students who rated confident or very confident in Chinese input (from 53% to 50%) in MS2 whereas a statistically significant increase was observed in English input (from 66% to 68%) for P4 students in MS2.

Students were confident in information search

When primary school students were asked about their self-perceived levels of confidence in using IT to perform different learning tasks (Table 6.21, [P6]SQ14a.i-v), it was found in MS1 that the mean values of P6 students were higher than those of P4 students for the same items. The ranges of mean values were 3.43 to 3.83 (SD:1.09-1.21) for P4 and 3.68 to 4.03 (SD:0.96-1.04) for P6 students on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. 64%, 51%, 47%, 48% and 57% of P4 students rated themselves as confident or very confident in "information search", "information selection", "information collation and analysis", "reporting and presentation" as well as "self-evaluation on learning outcomes" respectively. Similarly, 74%, 56%, 56%, 57% and 58% of P6 students perceived themselves as confident or very confident in the aforementioned skills respectively. No statistically significant difference was found in MS2.

Parents generally agreed on students' capability of using IT for learning, especially in information search

Parents' views on the students' capability in performing stated learning tasks with the use of IT are examined. In MS1, 67% of the surveyed parents agreed or strongly agreed that their children were capable of using IT in "information search". 40% of the parents agreed or strongly agreed that their children were capable of using IT to perform "information selection" and "self-evaluation on learning outcomes". 31% and 32% of the parents agreed or strongly agreed that their children were capable of using IT to perform the tasks in "information collation and analysis" as well as "reporting and presentation" respectively. The mean values fell in the range of 3.02 to 3.76 (SD:0.79-1.02) on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. A statistically significant increase was observed in the proportion of parents (from 32% to 33%) reported agreed or strongly that their children were capable of using IT in "reporting and presentation" in MS2 (Table 6.22, [P7]PQ4a-e).

Table 6.17 Frequency of students who were required to use IT to accomplish various tasks in learning activities at school ([P6]SQ4a-e)

Class levels		MS1 Mean (1-5)	MS1 SD	MS1 N	MS1 Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	MS2 Mean (1-5)	MS2 SD	MS2 N	MS2 Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	*P*-value
P4	a.	3.22	1.27	1779	403 (23)	284 (16)	558 (31)	363 (20)	172 (10)	3.27	1.20	1953	398 (20)	377 (19)	685 (35)	334 (17)	158 (8)	0.300
	b.	2.87	1.22	1777	219 (12)	301 (17)	556 (31)	435 (24)	267 (15)	2.90	1.21	1949	237 (12)	353 (18)	620 (32)	465 (24)	274 (14)	0.525
	c.	2.69	1.30	1778	222 (12)	248 (14)	464 (26)	445 (25)	399 (22)	2.73	1.27	1950	235 (12)	280 (14)	551 (28)	499 (26)	385 (20)	0.223
	d.	2.64	1.34	1774	228 (13)	256 (14)	406 (23)	426 (24)	459 (26)	2.66	1.31	1949	230 (12)	286 (15)	492 (25)	474 (24)	467 (24)	0.743
	e.	3.00	1.30	1775	317 (18)	299 (17)	473 (27)	443 (25)	243 (14)	3.06	1.26	1954	338 (17)	346 (18)	602 (31)	424 (22)	243 (12)	0.395
P6	a.	3.64	1.09	1944	536 (28)	507 (26)	627 (32)	217 (11)	58 (3)	3.63	1.07	2056	544 (26)	541 (26)	687 (33)	235 (11)	50 (2)	0.454
	b.	3.14	1.09	1944	246 (13)	449 (23)	708 (36)	411 (21)	130 (7)	3.19	1.06	2052	270 (13)	463 (23)	807 (39)	403 (20)	109 (5)	0.595
	c.	3.03	1.16	1942	249 (13)	392 (20)	652 (34)	462 (24)	187 (10)	3.07	1.13	2051	273 (13)	419 (20)	681 (33)	533 (26)	146 (7)	0.822
	d.	3.13	1.17	1942	298 (15)	413 (21)	644 (33)	418 (22)	169 (9)	3.16	1.15	2051	315 (15)	446 (22)	677 (33)	467 (23)	145 (7)	0.608
	e.	3.03	1.18	1944	278 (14)	354 (18)	646 (33)	475 (24)	191 (10)	3.02	1.14	2051	258 (13)	397 (19)	705 (34)	516 (25)	175 (9)	0.472

Tasks in learning activities

a. Information search (e.g. using search engine)
b. Information selection
c. Information collation and analysis (e.g. using spreadsheet)
d. Reporting and presentation (e.g. PowerPoint and website presentation)
e. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.18 Frequency of students using digital resources assigned by teachers and on their own initiative for self-learning beyond school hours during the week prior to the conduct of the questionnaire survey ([P6]SQ10a,b,11a,b)

	Percentage (%) choosing the option															
	Digital resources which teachers assigned students to use for learning subject knowledge								Digital resources which students used on their own initiative for self-learning							
	P4		*P*-value		P6		*P*-value		P4		*P*-value		P6		*P*-value	
	MS1 (N=1592)	MS2 (N=1746)			MS1 (N=1050)	MS2 (N=1808)			MS1 (N=1727)	MS2 (N=1911)			MS1 (N=1937)	MS2 (N=2032)		
Yes	55	55			60	54			55	52			59	49		
No	45	45	0.636[a]		40	46	0.005** [a]		45	48	0.016* [a]		41	51	0.000*** [a]	
Teachers didn't assign any digital resources for learning beyond school hours	11	11			10	12			--	--			--	--		
Valid count (N) (excluding no. of students choosing 'Teachers didn't assign any digital resource for learning beyond school hours')																
Frequency	**(N=882)**	**(N=961)**	**χ^2 (df=4)**	***P*-value**	**(N=1050)**	**(N=980)**	**χ^2 (df=4)**	***P*-value**	**(N=982)**	**(N=993)**	**χ^2 (df=4)**	***P*-value**	**(N=1144)**	**(N=991)**	**χ^2 (df=4)**	***P*-value**
16 times or above	6	4			5	3			8	7			6	6		
11 to 15 times	7	6			4	5			8	8			7	7		
5 to 10 times	19	20	5.25	0.262 [b]	22	19	9.305	0.054 [b]	24	24	2.86	0.581 [b]	28	26	2.11	0.716 [b]
1 to 4 times	58	58			62	65			52	51			54	54		
Nil	10	12			7	9			8	10			6	7		

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.]Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.19 School heads' levels of satisfaction with students' confidence in using IT for learning ([P1]HSQ1c-f)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied	
c	3.60	0.62	551	25	(5)	294	(53)	217	(39)	15 (3)	0 (0)	3.73	0.57	445	24	(5)	279	(63)	138	(31)	4 (1)	0 (0)	0.001**
d	3.62	0.72	551	51	(9)	265	(48)	210	(38)	25 (5)	0 (0)	3.75	0.57	445	25	(6)	288	(65)	127	(29)	5 (1)	0 (0)	0.001**
e	3.60	0.62	551	25	(5)	297	(54)	215	(39)	14 (3)	0 (0)	3.73	0.56	445	20	(4)	290	(65)	129	(29)	6 (1)	0 (0)	0.001**
f	3.49	0.68	551	21	(4)	261	(47)	237	(43)	30 (5)	2 (0)	3.62	0.65	445	27	(6)	233	(52)	172	(39)	13 (3)	0 (0)	0.006**

Aspects related to students' use of IT in learning

c. Students can use IT for information retrieval and evaluation of different information sources in their learning activities and to solve problems in their daily lives.

d. Students show the ability to learn independently and to widen their views by using digital resources in their learning activities according to their individual learning needs and pace.

e. Students can select appropriate IT tool(s) to conduct their learning and to solve problems in their daily lives.

f. Students show the ability to use IT as a productivity tool, a communication tool, a collaboration tool, a research tool and a decision-making tool in their learning activities.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.20 Students' self-perceived levels of confidence in using IT to perform related computing tasks ([P6]SQ19a-j)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident										
P4	a.	3.55	1.26	1769	524	(30)	411	(23)	516	(29)	152 (9)	167 (9)	3.47	1.24	1906	506	(27)	440	(23)	594	(31)	185 (10)	181 (9)	0.034*
	b.	3.86	1.18	1770	689	(39)	474	(27)	390	(22)	109 (6)	108 (6)	3.98	1.08	1904	786	(41)	514	(27)	455	(24)	76 (4)	73 (4)	0.026*
	c.	3.52	1.23	1764	483	(27)	431	(24)	523	(30)	177 (10)	150 (8)	3.57	1.17	1904	521	(27)	445	(23)	670	(35)	131 (7)	138 (7)	0.528
	d.	3.93	1.17	1767	767	(43)	396	(22)	409	(23)	104 (6)	91 (5)	4.07	1.07	1899	906	(48)	420	(22)	444	(23)	65 (3)	64 (3)	0.001**
	e.	3.67	1.22	1772	578	(33)	425	(24)	505	(29)	128 (7)	135 (8)	3.72	1.16	1902	615	(32)	494	(26)	557	(29)	118 (6)	118 (6)	0.382
	f.	3.51	1.25	1765	506	(29)	389	(22)	515	(29)	208 (12)	146 (8)	3.52	1.23	1903	530	(28)	444	(23)	585	(31)	179 (9)	165 (9)	0.926
	g.	3.67	1.22	1768	581	(33)	416	(24)	501	(28)	142 (8)	129 (7)	3.77	1.15	1904	661	(35)	472	(25)	547	(29)	120 (6)	104 (5)	0.058
	h.	3.52	1.21	1763	478	(27)	414	(23)	568	(32)	160 (9)	143 (8)	3.56	1.18	1898	518	(27)	457	(24)	615	(32)	175 (9)	132 (7)	0.612
	i.	3.54	1.21	1756	483	(28)	428	(24)	542	(31)	160 (9)	143 (8)	3.59	1.16	1894	519	(27)	481	(25)	630	(33)	135 (7)	130 (7)	0.385
	j.	3.38	1.32	1744	465	(27)	364	(21)	509	(29)	185 (11)	221 (13)	3.40	1.30	1886	486	(26)	420	(22)	574	(30)	171 (9)	235 (12)	0.540
P6	a.	3.60	1.15	1937	520	(27)	519	(27)	613	(32)	167 (9)	118 (6)	3.54	1.16	2039	519	(25)	542	(27)	614	(30)	240 (12)	123 (6)	0.167
	b.	4.01	1.02	1943	786	(40)	581	(30)	445	(23)	78 (4)	53 (3)	4.08	0.97	2037	852	(42)	646	(32)	427	(21)	75 (4)	38 (2)	0.086
	c.	3.66	1.10	1938	522	(27)	554	(29)	635	(33)	127 (7)	100 (5)	3.70	1.03	2036	538	(26)	610	(30)	698	(34)	127 (6)	64 (3)	0.236
	d.	4.14	1.00	1940	926	(48)	509	(26)	408	(21)	46 (2)	51 (3)	4.17	0.95	2033	971	(48)	566	(28)	402	(20)	63 (3)	32 (2)	0.409
	e.	3.92	1.04	1942	700	(36)	581	(30)	524	(27)	70 (4)	67 (3)	3.93	1.00	2034	715	(35)	656	(32)	519	(26)	95 (5)	48 (2)	0.824
	f.	3.79	1.11	1940	655	(34)	506	(26)	578	(30)	118 (6)	84 (4)	3.83	1.04	2037	678	(33)	562	(28)	618	(30)	126 (6)	53 (3)	0.477
	g.	4.00	1.03	1941	787	(41)	566	(29)	445	(23)	90 (5)	52 (3)	4.06	0.97	2033	844	(42)	623	(31)	457	(22)	70 (3)	39 (2)	0.143
	h.	3.72	1.05	1940	549	(28)	551	(28)	665	(34)	101 (5)	73 (4)	3.75	1.02	2032	577	(28)	601	(30)	679	(33)	117 (6)	58 (3)	0.635
	i.	3.70	1.06	1939	533	(27)	567	(29)	647	(33)	114 (6)	78 (4)	3.74	1.02	2026	556	(27)	625	(31)	669	(33)	112 (6)	64 (3)	0.394
	j.	3.49	1.17	1922	448	(23)	507	(26)	654	(34)	156 (8)	158 (8)	3.55	1.13	2023	489	(24)	549	(27)	697	(34)	161 (8)	127 (6)	0.198

Tasks

a. Chinese input via the computer

b. English input via the computer

c. Using the computer for learning (e.g. browsing electronic books)

d. Using computer to conduct entertaining activities (e.g. playing computer games)

e. Using the computer for daily activities (e.g. reading online newspapers)

f. Using the computer to store/retrieve digital resources (e.g. uploading and downloading files)

g. Searching information on the Internet

h. Using the Internet/other digital resources to conduct self-learning activities

i. Using the Internet/other digital resources to conduct learning activities assigned by teachers

j. Using e-learning platform[#] to conduct learning activities (e.g. browsing documents, submitting assignments and after school discussion)

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

Table 6.21 Students' self-perceived levels of confidence in using IT to perform different tasks ([P6]SQ14a.i-iv)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident										
P4	i.	3.83	1.10	1760	594	(34)	526	(30)	476	(27)	78	(4)	87	(5)	3.91	1.04	1923	666	(35)	630	(33)	473	(25)	85	(4)	69	(4)	0.125
	ii.	3.56	1.09	1755	403	(23)	492	(28)	637	(36)	126	(7)	97	(6)	3.60	1.05	1916	432	(23)	599	(31)	666	(35)	126	(7)	92	(5)	0.337
	iii.	3.49	1.15	1757	424	(24)	411	(23)	635	(36)	168	(10)	118	(7)	3.54	1.09	1911	437	(23)	527	(28)	672	(35)	180	(9)	96	(5)	0.321
	iv.	3.43	1.21	1755	422	(24)	423	(24)	546	(31)	220	(13)	144	(8)	3.49	1.14	1908	435	(23)	511	(27)	638	(33)	202	(11)	122	(6)	0.334
	v.	3.65	1.18	1746	518	(30)	466	(27)	513	(29)	125	(7)	124	(7)	3.73	1.12	1906	577	(30)	559	(29)	544	(29)	128	(7)	98	(5)	0.113
P6	i.	4.03	0.96	1933	731	(38)	686	(36)	420	(22)	44	(2)	51	(3)	4.10	0.88	2050	789	(38)	769	(38)	427	(21)	38	(2)	27	(1)	0.137
	ii.	3.69	0.98	1932	451	(23)	637	(33)	692	(36)	93	(5)	58	(3)	3.74	0.95	2049	472	(23)	771	(38)	667	(33)	84	(4)	55	(3)	0.184
	iii.	3.68	1.01	1929	465	(24)	625	(32)	658	(34)	115	(6)	66	(3)	3.67	0.97	2047	457	(22)	684	(33)	738	(36)	113	(6)	56	(3)	0.614
	iv.	3.69	1.04	1928	499	(26)	601	(31)	615	(32)	147	(8)	66	(3)	3.72	1.02	2046	533	(26)	670	(33)	639	(31)	140	(7)	64	(3)	0.459
	v.	3.71	1.03	1923	500	(26)	621	(32)	624	(32)	105	(5)	73	(4)	3.70	1.00	2045	502	(25)	678	(33)	683	(33)	119	(6)	63	(3)	0.468

Tasks

i. Information search (e.g. using search engine)
ii. Information selection
iii. Information collation and analysis (e.g. using spreadsheet)
iv. Reporting and Presentation (e.g. PowerPoint and website presentation)
v. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.22 Parents' levels of agreement on students' capability of using IT to perform different tasks ([P7]PQ4a-e)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Parents choosing the option								Mean (1-5)	SD	N	Count (%) of Parents choosing the option							
				Strongly agree		Agree		Neutral (一般)		Disagree		Strongly disagree										
a.	3.76	0.79	3195	510	(16)	1645	(51)	864	(27)	158	(5)	18	(1)	3.76	0.77	3527	534	(15)	1821	(52)	992	(28)	167	(5)	13	(0)	0.230
b.	3.31	0.83	3091	189	(6)	1055	(34)	1387	(45)	424	(14)	36	(1)	3.32	0.80	3408	195	(6)	1197	(35)	1565	(46)	414	(12)	37	(1)	0.333
c.	3.04	0.94	3052	178	(6)	751	(25)	1192	(39)	837	(27)	93	(3)	3.05	0.91	3377	168	(5)	888	(26)	1346	(40)	880	(26)	95	(3)	0.209
d.	3.02	1.02	3024	202	(7)	755	(25)	986	(33)	923	(31)	157	(5)	3.01	0.98	3372	186	(6)	924	(27)	1171	(35)	934	(28)	158	(5)	0.020*
e.	3.26	0.91	3005	223	(7)	1002	(33)	1230	(41)	470	(16)	80	(3)	3.25	0.90	3331	235	(7)	1092	(33)	1368	(41)	557	(17)	79	(2)	0.457

Tasks

a. Information search (e.g. using search engine)
b. Information selection
c. Information collation and analysis (e.g. using spreadsheet)
d. Reporting and Presentation (e.g. PowerPoint and website presentation)
e. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers perceived that students were quite confident (一般) in using IT to complete different learning tasks and solve problems in real-life situations

The confidence levels of students in using IT to complete different learning tasks and solve problems in real-life situations is reported by teachers. In MS1, 27% of the teachers thought that their students were confident or very confident in using IT to complete different learning tasks and solve real-life problems, with a mean rating of 3.18 (SD:0.59) on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. No statistically significant difference was reported in MS2 (Table 6.23, [P5]TQ19c).

Table 6.23 Teachers' perception of students' levels of confidence in using IT to complete different learning tasks and solve problems in real-life situations ([P5]TQ19c)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident	
Level of confidence of students in using IT to complete different learning tasks and solve problems in real life situations									
MS1	3.18	0.59	1817	10 (1)	468 (26)	1178 (65)	154 (8)	7 (0)	0.424
MS2	3.16	0.58	1788	11 (1)	427 (24)	1200 (67)	142 (8)	8 (0)	

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.1.6 Learning Support

Students mainly learnt to use software and hardware from parents or relatives and the computer or IT curriculum in schools

Students need support from schools, homes and other sources in their learning of IT. The most common channel in which students fully or mostly learnt to use the software and hardware in MS1 was "parents or relatives" (50% of P4 and 47% of P6), followed by "Computer or IT curriculum in school" (41% of P4, 36% of P6) and "Computer or IT-related extra-curricular activities in school" (38% of P4, 33% of P6). Less than 30% of the students (29% of P4, 23% of P6) indicated that they fully or mostly learnt those skills from "training activities organised by outside school organisations". The percentages of P4 students who fully or mostly learnt the software and hardware skills via this listed channels were greater than those of their P6 counterparts. No statistically significant difference was noted in MS2 except a decrease of the frequency of P6 in learning software and hardware from the channel of "training activities organised by outside school organisations" (from 23% to 22%) (Table 6.24, [P6]SQ18a-e).

Students tended to perceive the learning support from teachers to be sufficient while teachers indicated occasional provision of learning support for students

Table 6.25 shows the frequency and sufficiency levels of learning support that students received from teachers. In MS1, 43% of students in both levels reported that their teachers frequently or very frequently gave them support when they encountered difficulties in performing the learning activities with the use of IT, with mean ratings of 3.36 (SD:1.10) and 3.32 (SD:1.02) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' ([P6]SQ14b). To compare with the responses from teachers, a quarter of the teachers (25%) indicated that they frequently or very frequently provided learning support for their students when using IT, with a mean rating of 3.01 (SD:0.83) ([P5]TQ14b). A statistically significant increase was noted in the level of frequency that teachers and students provided or received learning support in MS2. 47% of students and 28% of the teachers reported frequently or very frequently receiving or providing learning support in MS2. Regarding the sufficiency of learning support received from teachers, more than half of the students (59% of P4 and 55% of P6) in MS1 considered the support from teachers as sufficient or very sufficient, with mean ratings of 3.66 (SD:1.01) and 3.53 (SD:0.99) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant increase was observed in the percentages of students (64% of P4 and 60% of P6) rating sufficient or very sufficient to the learning support received from teachers in MS2 (Table 6.25, [P6]SQ14c).

Table 6.24 The channel(s) from which students learnt the software and hardware skills ([P6]SQ18a-e)

Class levels		MS1 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Fully	Mostly	Partly	Rarely	None	MS2 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Fully	Mostly	Partly	Rarely	None	*P*-value
P4	a.	2.97	1.29	1747	267 (15)	319 (18)	563 (32)	291 (17)	306 (18)	3.02	1.27	1890	291 (15)	367 (19)	628 (33)	298 (16)	306 (16)	0.183
	b.	3.14	0.98	1748	269 (15)	448 (26)	547 (31)	235 (13)	249 (14)	3.16	0.98	1881	274 (15)	475 (25)	643 (34)	257 (14)	232 (12)	0.843
	c.	3.07	1.30	1735	293 (17)	367 (21)	539 (31)	243 (14)	293 (17)	3.08	1.24	1879	281 (15)	397 (21)	663 (35)	261 (14)	278 (15)	0.673
	d.	3.37	1.31	1748	419 (24)	456 (26)	456 (26)	191 (11)	227 (13)	3.42	1.26	1884	444 (24)	522 (28)	510 (27)	195 (10)	212 (11)	0.579
	e.	2.65	1.39	1733	222 (13)	274 (16)	443 (26)	257 (15)	537 (31)	2.59	1.41	1870	233 (12)	285 (15)	483 (26)	223 (12)	646 (35)	0.198
P6	a.	3.02	1.15	1932	221 (11)	389 (20)	757 (39)	331 (17)	235 (12)	2.99	1.14	2021	217 (11)	411 (20)	784 (39)	363 (18)	246 (12)	0.590
	b.	3.11	0.98	1929	194 (10)	506 (26)	735 (38)	300 (16)	193 (10)	3.12	0.98	2018	206 (10)	546 (27)	763 (38)	282 (14)	221 (11)	0.934
	c.	3.02	1.13	1930	203 (11)	418 (22)	765 (40)	310 (16)	235 (12)	2.99	1.17	2017	207 (10)	456 (23)	752 (37)	311 (15)	290 (14)	0.317
	d.	3.25	1.24	1928	320 (17)	579 (30)	543 (28)	240 (12)	246 (13)	3.28	1.23	2023	336 (17)	620 (31)	579 (29)	242 (12)	246 (12)	0.646
	e.	2.52	1.31	1927	175 (9)	276 (14)	538 (28)	328 (17)	610 (32)	2.42	1.32	2016	174 (9)	267 (13)	509 (25)	342 (17)	725 (36)	0.011*

Channels which students learnt to use software/hardware

a. Fellow students/Friends
b. Computer/IT curriculum in school
c. Computer/IT-related extra-curricular activities in school
d. Parents/Relatives
e. Training activities organised by outside school organisations (e.g. computer companies and community centres)

Mean: 1= "None" and 5="Fully"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.25 The frequency in which teachers give learning support for students when they encounter difficulties in performing the learning activities with the use of IT and students' levels of sufficiency to such support from teachers ([P6]SQ14b,c, [P5]TQ14b)

Class levels	MS1 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	MS2 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	*P*-value
Level of frequency (Mean: 1="Never" and 5="Very frequently")																	
P4	3.36	1.10	1769	321 (18)	436 (25)	664 (38)	247 (14)	101 (6)	3.45	1.08	1912	374 (20)	518 (27)	703 (37)	227 (12)	91 (5)	0.011*
P6	3.32	1.02	1923	242 (13)	572 (30)	762 (40)	249 (13)	99 (5)	3.45	0.97	2038	296 (14)	678 (33)	765 (38)	241 (12)	59 (3)	0.000***
Teachers	3.01	0.83	1812	64 (4)	373 (21)	955 (53)	354 (20)	66 (4)	3.10	0.79	1782	63 (4)	428 (24)	969 (54)	275 (15)	47 (3)	0.000***

Class levels	MS1 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally insufficient	MS2 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally insufficient	*P*-value
Level of sufficiency (Mean: 1="Totally insufficient" and 5="Very sufficient")																	
P4	3.66	1.01	1761	375 (21)	664 (38)	535 (30)	115 (7)	71 (4)	3.78	0.98	1901	473 (25)	750 (39)	515 (27)	104 (5)	59 (3)	0.000***
P6	3.53	0.99	1927	301 (16)	742 (39)	658 (34)	133 (7)	92 (5)	3.64	0.94	2037	331 (16)	900 (44)	608 (30)	133 (7)	65 (3)	0.000***

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.1.7 School ITEd Curriculum

School heads tended to be very satisfied that students were given the opportunities to learn about IT knowledge and skills

Table 6.26 ([P1]HSQ3a,c) showed that school heads tended to be very satisfied with the provision of school ITEd curriculum which helped to develop students' IT skills and to foster the development of information literacy and generic skills through the application of such skills in learning activities across the KLAs. In MS1, most of school heads (95%) were satisfied or very satisfied that students were "given the opportunities to learn about IT knowledge and skills". 79% of them were also satisfied or very satisfied that the school curriculum provided "a learning context for students to use IT to acquire learning resources and also as a tool for learning, solving problems and sharing their achievements". There was no statistically significant difference for these two aspects in MS2.

Nearly all schools offered Computer or IT subjects — schools followed closely the guidelines of Information Technology Learning Targets in school IT curriculum

School IT curriculum refers to the learning experiences set out in the Information Technology Learning Targets. Nearly all primary schools (99%) offered Computer or IT subjects in both MS1 and MS2 ([P3]ITEdInfoQ7a). The contents of Computer or IT curriculum in primary schools were surveyed by the School ITEd Survey (Table 6.27, [P3]ITEdInfoQ8a-c). The findings showed that primary schools closely followed the guidelines of Information Technology Learning Targets (CDC, 2000)[11] in preparing learning and teaching activities to develop students' capability in using IT. Basic hardware operation skills were taught in lower class levels. Skills in using software for communication, word processing, presentation and web design were then developed in upper class levels. Information searching skill, sense of intellectual property and personal data privacy awareness as well as proper use of IT were fostered since P3.

As for the software taught in Computer or IT subject in MS1, "word processing software" was taught mainly in P3 (63%) and P4 (68%) while "spreadsheet" was taught mainly in P5 (46%) and P6 (57%). "Chinese input" was taught mainly in P4 (77%) and "presentation software" was taught mainly in P5 (78%). "Online communication software" and "online information searching tools" were taught mainly in P3 (42% and 57% respectively), P4 (64% and 54% respectively) and P5 (46% and 48% respectively). "Web design or editing software" and "multi-media design" were mainly taught in P6 (87% and 49% respectively). "Computer graphic design software" was mainly taught in P5 (43%) and P6 (61%). 71% and 76% of the primary schools did not include "programming" and "audio or video editing software" in the curriculum respectively ([P3]ITEdInfoQ8a).

As far as the teaching of hardware skills in Computer or IT subject was concerned in MS1, the use of "printer" (35% for P1, 41% for P2, 37% for P3 and 33% for P4) and "keyboard" (76% for P1, 63% for P2, 46% for P3 and 34% for P4) were mainly taught in P4 or lower class levels. The use of "CD-ROM writer" was mainly taught in P1 (33%) and P2 (35%). The operation of "scanner" was mainly taught in P6 (35%). 41% to 75% of the primary schools did not teach how to use "digital camera" (41%), "digital video recorder" (59%), "mobile devices" (75%) and "network devices" (72%) in the curriculum ([P3]ITEdInfoQ8b).

[11] Students at Stage I (P1 to P3) are targeted to develop their interest in using IT and operate simple IT tools. Students at Stage II (P4 to P6) are expected to develop simple techniques in information processing and communication skills with the awareness of privacy and copyright.

Regarding the contents related to the information literacy skills taught in Computer or IT curriculum, the information-processing skills and correct attitude of using IT were mainly developed in upper class levels. In MS1, more than 50% of the primary schools included "information search" (67% for P3, 69% for P4, 65% for P5 and 57% for P6) and "proper use of IT such as Internet security" (52% for P3, 65% for P4, 74% for P5 and 66% for P6) in the curriculum for P3 or upper class students. "Information selection" (59% for P4, 69% for P5 and 62% for P6), "intellectual property awareness" (61% for P4, 69% for P5 and 66% for P6), "personal data privacy awareness" (57% for P4, 65% for P5 and 62% for P6) were mainly taught at P4, P5 and P6 levels. "Information collation and analysis" (72% for P5 and 70% for P6) as well as "reporting and presentation" (79% for P5 and 75% for P6) were mainly taught at P5 and P6 levels ([P3]ITEdInfoQ8c).

A statistically significant increase was observed in the percentages of schools which taught the use of the following software and hardware in the Computer/IT curriculum in MS2: "online communication software" at P3 (from 42% to 51%), "audio or video editing software" at P2 (from 0% to 3%) and P3 (from 1% to 4%), "presentation software" at P4 (from 31% to 38%), "mobile devices" at P6 (from 8% to 12%) as well as "network devices" at P5 (from 8% to 13%) and P6 (from 11% to 16%). The percentages of schools which taught the contents related to the correct attitude of using IT at lower class levels significantly increased statistically in MS2: "intellectual property awareness" at P2 (from 37% to 44%) and P3 (from 47% to 53%), "proper use of IT" at P3 (from 52% to 61%) and "personal data privacy awareness" at P2 (from 29% to 37%). In contrast, the percentages of schools which taught the use of "computer graphic design" at P1 (from 20% to 15%), "presentation software" at P2 (from 1% to 0%), "Printer" at P4 (from 33% to 26%) and "Scanner" at P6 (from 35% to 24%) significantly decreased statistically in MS2.

Table 6.26 School heads' levels of satisfaction with the opportunities given to students' use of IT in learning ([P1]HSQ3a,c)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option								Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied	
a	4.35	0.58	551	222	(40)	302	(55)	26	(5)	1	(0)	0	(0)	4.39	0.54	445	186	(42)	247	(56)	12	(3)	0	(0)	0	(0)	0.392
c	3.91	0.61	551	72	(13)	366	(66)	107	(19)	5	(1)	1	(0)	3.98	0.58	445	67	(15)	306	(69)	70	(16)	1	(0)	1	(0)	0.075

Aspects related to students' use of IT in learning

a. Students are given the opportunities to learn about IT knowledge and skills.

c. The school curriculum provides a learning context for students to use IT to acquire learning resources and also as a tool for learning, solving problems and sharing their achievements.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.27 Contents of Computer/IT curriculum in teaching software, hardware and information literacy ([P3]ITEdInfoQ8a-c)

Contents of Computer/IT curriculum	Percentage (%) choosing the options													P-value						
	MS1							MS2													
	P1	P2	P3	P4	P5	P6	Not being taught in primary school	P1	P2	P3	P4	P5	P6	Not being taught in primary school	P1	P2	P3	P4	P5	P6	Not being taught in primary school
	(N=543)							(N=430)													
Software																					
i. Word processing software	10	24	63	68	25	19	1	12	24	65	70	24	18	1	0.286	0.916	0.540	0.401	0.587	0.726	0.702
ii. Spreadsheet	1	1	4	19	46	57	5	0	0	3	20	50	59	3	0.591	0.173	0.756	0.699	0.305	0.595	0.116
iii. Presentation software	0	1	6	31	78	22	1	0	0	6	38	79	22	0	1.000	0.046*	0.772	0.019*	0.777	0.914	0.029*
iv. Online communication software (e.g. E-mail)	10	17	42	64	46	37	2	12	19	51	67	44	35	1	0.207	0.357	0.005**	0.456	0.554	0.540	0.349
v. Online information searching tools (e.g. browser and search engine)	15	27	57	54	48	36	1	15	32	62	55	46	36	1	0.728	0.133	0.153	0.677	0.531	0.776	0.675
vi. Web design/editing software	0	0	1	3	20	87	6	0	0	0	3	22	89	3	1.000	1.000	0.850	0.993	0.531	0.366	0.071
vii. Computer graphic design (e.g. drawing and photo editing)	20	26	19	24	43	61	7	15	23	20	24	49	56	6	0.048*	0.341	0.712	0.912	0.070	0.116	0.526
viii. Multi-media design (e.g. animation design)	0	0	1	4	18	49	43	0	0	1	3	18	52	39	1.000	1.000	0.489	0.871	0.998	0.275	0.215
ix. Programming (e.g. Logo and Java)	0	0	0	1	3	28	71	0	0	0	0	2	25	73	1.000	1.000	1.000	0.591	0.504	0.425	0.528
x. Audio/Video editing software (e.g. editing and file format conversion)	1	0	1	3	9	21	76	0	3	4	3	10	20	71	0.591	0.001***	0.001**	0.516	0.392	0.756	0.111
xi. Chinese input	3	7	31	77	44	32	2	3	10	39	79	43	34	1	0.532	0.114	0.005**	0.578	0.671	0.481	0.456
Hardware																					
i. Printer (打印機)	35	41	37	33	24	22	11	39	39	34	26	19	18	10	0.167	0.577	0.369	0.010*	0.053	0.106	0.662
ii. CD-ROM (CD-R or DVD-R) Writer (光碟機/光碟燒錄機)	33	35	29	21	20	21	19	36	37	30	20	17	20	15	0.419	0.483	0.869	0.623	0.298	0.623	0.080
iii. Digital Camera (數碼相機)	5	7	14	19	27	25	41	8	9	14	16	29	20	41	0.061	0.189	0.933	0.345	0.552	0.070	0.873
iv. Digital Video Recorder (數碼攝錄機)	3	4	10	10	15	20	59	4	5	8	9	17	19	59	0.221	0.611	0.516	0.788	0.526	0.665	0.942
v. Scanner (掃描器)	9	11	15	23	26	35	24	10	11	17	21	30	24	25	0.693	0.993	0.447	0.385	0.144	0.000***	0.684
vi. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)])	6	4	7	8	8	8	75	6	5	8	7	11	12	67	0.836	0.732	0.670	0.864	0.133	0.029*	0.004**
vii. Network Devices (e.g. Domestic Network Devices)	2	4	8	9	8	11	72	3	5	11	9	13	16	65	0.426	0.417	0.130	0.999	0.012*	0.023*	0.012*
viii. Use of Keyboard	76	63	46	34	23	22	1	77	61	43	32	22	20	2	0.724	0.602	0.285	0.488	0.619	0.493	0.846
Information Literacy																					
i. Information search	16	30	67	69	65	57	1	21	36	67	67	62	54	1	0.026*	0.054	0.846	0.528	0.333	0.464	0.740
ii. Information selection	4	10	35	59	69	62	7	4	13	35	59	66	57	5	0.999	0.193	0.972	0.861	0.461	0.140	0.125
iii. Information collation and analysis	2	4	18	46	72	70	8	2	4	17	46	73	70	7	0.810	0.562	0.595	0.987	0.800	0.844	0.316
iv. Reporting and Presentation	5	8	16	44	79	75	6	4	6	14	46	78	76	4	0.448	0.380	0.541	0.667	0.691	0.859	0.109
v. Intellectual Property Awareness	25	37	47	61	69	66	4	31	44	53	63	74	65	2	0.058	0.019*	0.050*	0.652	0.142	0.885	0.112
vi. Personal Data Privacy Awareness	24	29	41	57	65	62	10	29	37	47	56	69	61	10	0.063	0.006**	0.055	0.765	0.255	0.719	0.947
vii. Proper use of IT (e.g. Internet security)	25	33	52	65	74	66	3	29	38	61	66	73	65	3	0.232	0.109	0.009**	0.840	0.760	0.700	0.845

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.2 Empowering Teachers with IT

The second strategic goal is "Empowering teachers with IT". The purpose is to enable teachers to make good pedagogical use of IT so as to stimulate students' thinking or facilitate students to construct their own knowledge. To track the progress of this goal, the following aspects related to teachers' use of IT in teaching are examined:

- Teachers' IT competency
- Perceived application of IT in teaching
- Belief and attitude towards using IT for learning and teaching
- Teaching with IT
- Confidence in using IT for learning and teaching
- School professional development in ITEd for teachers
- School ITEd sharing and collaboration among teachers
- Areas for improvement of ITEd development

6.2.1 Teachers' IT Competency

School heads were satisfied with teachers' IT competency

Teachers should acquire adequate IT competency in order to use IT in conducting teaching and administrative duties. 94% of school heads were satisfied or very satisfied with teachers' IT competency in MS1. No statistically significant difference was found in MS2 (Table 6.28, [P1]HSQ2a).

Table 6.28 School heads' levels of satisfaction with teachers' IT competency ([P1]HSQ2a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Teachers' IT competency meets the requirements of Education and Manpower Bureau."									
MS1	4.21	0.54	551	152 (28)	366 (66)	32 (6)	1 (0)	0 (0)	0.117
MS2	4.27	0.56	445	146 (33)	272 (61)	27 (6)	0 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers were generally proficient in software and hardware skills

When looking at teachers' self-evaluated proficiency in terms of software skills, as reported in MS1, 72% to 85% of the teachers thought that they were proficient or highly proficient in using software such as "word processing software" (85%), "online communication software" (77%), "online information searching tools" (77%) and "presentation software" (72%). 49% and 63% of them thought that they were proficient or highly proficient in using "spreadsheet" and "Chinese input" respectively. Teachers' competency in using more advanced tools such as: "web design or editing software" (23%), "computer graphic design such as drawing and photo-editing software" (27%), "multi-media design software" (13%) and "audio or video editing software" (15%) were all relatively low, with 13% to 27% of the teachers rated themselves as proficient or highly proficient. The software with the lowest proportion of the surveyed teachers rated themselves as proficient or highly proficient users was "programming" (8%). A statistically significant decrease was noted in the percentages of teachers rating themselves as proficient or highly proficient in using "word processing software" (from 85% to 81%), but there was a statistically significant increase in their proficiency in using "multi-media design software" (from 13% to 16%), "audio or video editing software" (from 15% to 17%) and "programming" (from 8% to 9%) in MS2 (Table 6.29 [P5]TQ31a-k).

When looking at teachers' self-evaluated proficiency of hardware skills in MS1, higher proportions of the surveyed teachers rated themselves as proficient or highly proficient in the use of "printer" (77%) and "keyboard" (73%). These were followed by "CD-ROM writer" (65%), "digital camera" (62%), "scanner" (56%) and "digital video recorder" (48%). Lower proportions of the teachers reported themselves as proficient or highly proficient in using all other types of hardware such as "LCD projector" (35%), "network devices" (28%), "mobile devices" (26%) and "portable multi-media player devices" (25%). A statistically significant increase in MS2 was observed in teachers' self-evaluated proficiency level in using "digital video recorder" (from 48% to 51%), "mobile devices" (from 26% to 30%), "network devices" (from 28% to 31%), "portable multi-media player devices" (from 25% to 29%) and "LCD Projector" (from 35% to 39%). However, a statistically significant decrease was noted in MS2 in teachers' self-evaluated proficiency level in using "printer" (from 77% to 74%) (Table 6.30, [P5]TQ32a-k).

Table 6.29 Teachers' self-evaluated levels of proficiency in software use ([P5]TQ31a-k)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all									
a. Word processing software	4.05	0.63	1824	387	(21)	1174	(64)	238	(13)	24	(1)	1	(0)	3.99	0.65	1800	353	(20)	1098	(61)	332	(18)	14	(1)	3	(0)	0.002**
b. Spreadsheet	3.37	0.88	1819	105	(6)	781	(43)	694	(38)	169	(9)	70	(4)	3.40	0.86	1797	122	(7)	743	(41)	720	(40)	153	(9)	59	(3)	0.678
c. Presentation software	3.83	0.79	1822	313	(17)	1006	(55)	406	(22)	81	(4)	16	(1)	3.82	0.77	1799	296	(16)	970	(54)	459	(26)	62	(3)	12	(1)	0.312
d. Online communication software (e.g. E-mail).	3.94	0.74	1823	369	(20)	1048	(57)	343	(19)	55	(3)	8	(0)	3.93	0.73	1798	356	(20)	1011	(56)	379	(21)	47	(3)	5	(0)	0.379
e. Online information searching tools (e.g. browser and search engine)	3.92	0.77	1820	364	(20)	1036	(57)	347	(19)	57	(3)	16	(1)	3.89	0.78	1792	342	(19)	1009	(56)	370	(21)	48	(3)	23	(1)	0.277
f. Web design/editing software	2.72	1.06	1821	69	(4)	351	(19)	689	(38)	430	(24)	282	(15)	2.75	1.03	1796	45	(3)	382	(21)	707	(39)	398	(22)	264	(15)	0.330
g. Computer graphic design (e.g. drawing and photo editing software)	2.80	1.08	1821	78	(4)	415	(23)	668	(37)	388	(21)	272	(15)	2.83	1.06	1796	60	(3)	448	(25)	680	(38)	347	(19)	261	(15)	0.279
h. Multi-media design software (e.g. animation design)	2.19	1.10	1819	32	(2)	205	(11)	504	(28)	422	(23)	656	(36)	2.29	1.12	1797	36	(2)	247	(14)	506	(28)	416	(23)	592	(33)	0.014 *
i. Programming (e.g. Logo and Java)	1.74	1.04	1822	24	(1)	120	(7)	300	(16)	297	(16)	1081	(59)	1.84	1.08	1794	22	(1)	148	(8)	342	(19)	285	(16)	997	(56)	0.008**
j. Audio/Video editing software (e.g. editing and file format conversion)	2.15	1.17	1820	61	(3)	216	(12)	397	(22)	407	(22)	739	(41)	2.29	1.17	1795	55	(3)	259	(14)	463	(26)	390	(22)	628	(35)	0.000***
k. Chinese input	3.57	1.14	1815	341	(19)	803	(44)	374	(21)	143	(8)	154	(8)	3.56	1.09	1797	313	(17)	791	(44)	420	(23)	140	(8)	133	(7)	0.446

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.30 Teachers' self-evaluated levels of proficiency in hardware use ([P5]TQ32a-k)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all									
a. Printer	3.91	0.68	1828	298	(16)	1112	(61)	382	(21)	27	(2)	9	(1)	3.86	0.69	1800	260	(14)	1084	(60)	413	(23)	33	(2)	10	(1)	0.034*
b. CD-ROM (CD-R or DVD-R) Writer	3.68	0.90	1823	263	(14)	935	(51)	476	(26)	84	(5)	65	(4)	3.67	0.87	1799	233	(13)	936	(52)	495	(28)	78	(4)	57	(3)	0.460
c. Digital Camera	3.61	0.94	1827	253	(14)	885	(48)	480	(26)	143	(8)	66	(4)	3.67	0.88	1799	241	(13)	921	(51)	478	(27)	112	(6)	47	(3)	0.169
d. Digital Video Recorder	3.25	1.11	1825	173	(10)	700	(38)	556	(30)	204	(11)	192	(11)	3.34	1.03	1798	154	(9)	756	(42)	588	(33)	148	(8)	152	(8)	0.028*
e. Scanner	3.49	0.98	1826	209	(11)	816	(45)	546	(30)	163	(9)	92	(5)	3.53	0.93	1796	206	(11)	827	(46)	549	(31)	146	(8)	68	(4)	0.262
f. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)]	2.52	1.28	1828	102	(6)	371	(20)	495	(27)	275	(15)	585	(32)	2.70	1.22	1798	85	(5)	442	(25)	575	(32)	241	(13)	455	(25)	0.000***
g. Network Devices (e.g. Domestic Network Devices)	2.59	1.27	1825	93	(5)	427	(23)	501	(27)	250	(14)	554	(30)	2.78	1.22	1797	94	(5)	475	(26)	588	(33)	222	(12)	418	(23)	0.000***
h. Portable Computer Game Devices	2.30	1.26	1822	77	(4)	293	(16)	468	(26)	243	(13)	741	(41)	2.49	1.25	1797	81	(5)	341	(19)	549	(31)	225	(13)	601	(33)	0.000***
i. Portable Multi-media Player Devices	2.50	1.27	1824	93	(5)	363	(20)	510	(28)	256	(14)	602	(33)	2.70	1.23	1796	95	(5)	429	(24)	570	(32)	252	(14)	450	(25)	0.000***
j. LCD Projector	2.86	1.22	1824	121	(7)	509	(28)	563	(31)	260	(14)	371	(20)	3.00	1.17	1798	119	(7)	569	(32)	614	(34)	188	(10)	308	(17)	0.000***
k. Use of Keyboard	3.85	0.81	1819	341	(19)	987	(54)	404	(22)	57	(3)	30	(2)	3.85	0.80	1792	324	(18)	968	(54)	431	(24)	37	(2)	32	(2)	0.585

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.2.2 Perceived Application of IT in Teaching

School heads were satisfied with teachers' use of IT in daily teaching and learning management as well as in cross-subject learning activities

Table 6.31 ([P1]HSQ2e-k,3b) shows the satisfaction levels of school heads with respect to the teachers' use of IT in teaching. In MS1, 85% of the respondents were satisfied or very satisfied with the outcome on teachers' use of IT in daily teaching and learning management. 82% of them were satisfied or very satisfied that teachers could provide students with the opportunities to use IT in various cross-subject learning activities. Both items had mean ratings higher than 3.97 on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. As for the other outcomes of empowering teachers with IT, around 70% of the respondents were satisfied or very satisfied with the outcomes such as teachers' use of IT in promoting students to learn subject knowledge of different KLAs (72%), teachers' use of IT to create the opportunities to encourage students to develop their learning ability and to foster students' positive attitude and value of using IT (72%) and teachers' use of IT in creating the opportunities for students to work collaboratively (71%). A relatively smaller proportion of school heads were satisfied or very satisfied with the outcomes that teachers could use IT to create a learning environment to support students' active independent learning (61%), to monitor and assess the performance of students (56%) and to collate information on students' learning progress so as to tailor for individual differences through learning activities (47%), with mean ratings fell in the range of 3.45 to 3.65 (SD:0.62-0.71) on a scale of 1 to 5 where 1 was 'totally not satisfied' and '5 was 'very satisfied'. A statistically significant increase in the level of school heads' satisfaction was observed in the following aspects in MS2: teachers' use of IT in their daily learning and teaching management (from 85% to 91%), teachers' use of IT to monitor and assess students' performance so as to encourage students' continuous improvement (from 56% to 66%), teachers' use of IT to collate information on students' learning progress so as to tailor for individual differences through learning activities (from 47% to 59%) and teachers' use of IT to create a learning environment to support students' active independent learning (from 61% to 69%).

Teachers perceived a higher level of agreement that they used IT to motivate students in the learning of key learning areas as well as provided opportunities for students to acquire IT knowledge and skills, but they perceived a lower level of agreement that they used IT for monitoring and assessment of students' performance and learning progress

When primary school teachers were asked about their perceived application of IT into different learning and teaching tasks (Table 6.32, [P5]TQ30a-h), as reported in MS1, around two-thirds of the teachers agreed or strongly agreed that they used IT to achieve learning outcomes, such as providing the opportunities for students to acquire IT knowledge and skills (61%) and using IT to motivate students in the learning of respective KLAs (60%). 53% of them agreed or strongly agreed that they facilitated students to use IT in cross-curricular learning activities and created the opportunities to encourage students to develop their learning ability with the use of IT and to foster their positive attitude and value in using IT. Around half of the surveyed teachers agreed or strongly agreed that they created a supportive learning environment for students' active independent learning (50%) and made use of IT to create the opportunities for students to work collaboratively (47%). On the other hand, 40% of the respondents agreed or strongly agreed that they applied IT for monitoring and assessment of students' performance as well as to encourage students' continuous improvement. 36% of the respondents agreed or strongly agreed that they used IT as a tool in collating information on students' progress in learning so that learning activities could be designed to cater for individual learning differences. A statistically significant increase was observed in all items of teachers' self-evaluation on their cognition and application of ITEd (MS1: 36%-61%; MS2: 42%-66%) in MS2 except in the area of providing the opportunities for students to acquire IT knowledge and skills.

Table 6.31 School heads' levels of satisfaction with teachers' use of IT in teaching ([P1]HSQ2e-k,3b)

	MS1												MS2												*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option									Mean (1-5)	SD	N	Count (%) of School Heads choosing the option									
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied	
2e.	4.06	0.63	551	122	(22)	346	(63)	77	(14)	6	(1)	0	(0)	4.15	0.61	445	115	(26)	288	(65)	38	(9)	3	(1)	1	(0)	0.017*
2f.	3.81	0.62	551	57	(10)	342	(62)	146	(26)	5	(1)	1	(0)	3.87	0.57	445	41	(9)	311	(70)	89	(20)	3	(1)	1	(0)	0.095
2g.	3.81	0.18	551	57	(10)	341	(62)	146	(26)	7	(1)	0	(0)	3.87	0.53	445	37	(8)	317	(71)	89	(20)	2	(0)	0	(0)	0.089
2h.	3.58	0.62	551	39	(7)	272	(49)	212	(38)	28	(5)	0	(0)	3.71	0.64	445	34	(8)	257	(58)	145	(33)	8	(2)	1	(0)	0.004**
2i.	3.45	0.70	551	30	(5)	229	(42)	252	(46)	39	(7)	1	(0)	3.61	0.66	445	24	(5)	242	(54)	159	(36)	20	(4)	0	(0)	0.000***
2j.	3.65	0.71	551	43	(8)	294	(53)	194	(35)	20	(4)	0	(0)	3.75	0.63	445	36	(8)	270	(61)	131	(29)	7	(2)	1	(0)	0.019*
2k.	3.77	0.68	551	59	(11)	329	(60)	142	(26)	20	(4)	1	(0)	3.81	0.63	445	41	(9)	291	(65)	100	(22)	13	(3)	0	(0)	0.378
3b	3.97	0.62	551	92	(17)	357	(65)	97	(18)	4	(1)	1	(0)	4.03	0.53	445	70	(16)	321	(72)	53	(12)	1	(0)	0	(0)	0.129

Aspects related to teachers' application of ITEd

2e. Teachers can use IT in their daily teaching and learning management.
2f. Teachers can use IT to promote students in learning the subject knowledge of different key learning areas (KLAs) (e.g. to establish the context for learning and to explain abstract concepts).
2g. Teachers can create opportunities to encourage students to develop their learning ability with the use of IT, and to foster students' positive attitude and value of using IT.
2h. Teachers can use IT to monitor and to assess the performance of students so as to encourage students' continuous improvement.
2i. Teachers use IT to collate information on students' progress in learning so that learning activities can be designed to cater for individual needs.
2j. Teachers can use IT to create a learning environment to support students' active independent learning.
2k. Teachers can use IT to create opportunities for students to work collaboratively.
3b. Teachers can provide students the opportunity to use IT in various cross-subject learning activities.
Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.32 Teachers' levels of agreement on their cognition and application of ITEd ([P5]TQ30a-h)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option									Mean (1-5)	SD	N	Count (%) of Teachers choosing the option									
				Strongly agree		Agree		Neutral		Disagree		Strongly disagree				Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
a. You have used IT to motivate students in the learning of respective Key Learning Areas (KLAs) (e.g. to establish the learning context and to explain abstract concepts).	3.55	0.71	1825	66	(4)	1013	(56)	618	(34)	109	(6)	19	(1)	3.65	0.63	1796	65	(4)	1116	(62)	544	(30)	62	(3)	9	(1)	0.000***
b. You have created opportunities to encourage students to develop their learning ability with the use of IT, and to foster positive attitude and value in using IT.	3.46	0.70	1824	47	(3)	909	(50)	726	(40)	126	(7)	16	(1)	3.52	0.66	1796	39	(2)	969	(54)	684	(38)	95	(5)	9	(1)	0.018*
c. You have used IT to monitor and assess the performance of students as well as to encourage students' continuous improvement.	3.22	0.81	1823	34	(2)	698	(38)	770	(42)	277	(15)	44	(2)	3.34	0.76	1794	37	(2)	779	(43)	765	(43)	180	(10)	33	(2)	0.000***
d. You have used IT as a tool to collate information on students' progress in learning so that learning activities can be designed to cater for individual learning differences.	3.14	0.83	1824	30	(2)	621	(34)	804	(44)	307	(17)	62	(3)	3.30	0.77	1794	41	(2)	724	(40)	799	(45)	192	(11)	38	(2)	0.000***
e. You have provided opportunities for students to acquire IT knowledge and skills.	3.55	0.72	1824	66	(4)	1044	(57)	570	(31)	124	(7)	20	(1)	3.60	0.68	1794	75	(4)	1041	(58)	580	(32)	87	(5)	11	(1)	0.139
f. You have facilitated students to use IT in cross-curricular learning activities.	3.44	0.75	1824	54	(3)	908	(50)	674	(37)	163	(9)	25	(1)	3.55	0.69	1793	56	(3)	1006	(56)	611	(34)	104	(6)	16	(1)	0.000***
g. You have used IT to create a supportive learning environment for students' active independent learning.	3.41	0.74	1824	45	(2)	871	(48)	724	(40)	160	(9)	24	(1)	3.52	0.68	1794	49	(3)	967	(54)	666	(37)	97	(5)	15	(1)	0.000***
h. You have used IT to create opportunities for students to work collaboratively.	3.36	0.77	1820	44	(2)	822	(45)	726	(40)	199	(11)	29	(2)	3.47	0.72	1792	44	(2)	928	(52)	669	(37)	129	(7)	22	(1)	0.000***

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.2.3 Belief and Attitude towards Using IT for Learning and Teaching

Teachers perceived a higher level of agreement that the use of IT could enhance teaching effectiveness, but they perceived a lower level of agreement that it could strengthen the relationship between teachers and students

Teachers' belief and attitude towards using IT for teaching were examined by asking the surveyed teachers to indicate their levels of agreement to a number of benefits about using IT for teaching. In MS1, majority of them (86%) agreed or strongly agreed that IT could enhance teaching effectiveness. About 52% to 61% of the teachers agreed or strongly agreed to other benefits of using IT: time saving and convenience (61%), facilitating assessment and evaluation of students' learning progress (55%), facilitating effective planning and management of teaching process (55%) as well as providing immediate feedback to students in their learning (52%). With regard to strengthening the relationship between teachers and students, the lowest level of agreement was received (36%) (Table 6.33, [P5]TQ16a-f). With respect to the teachers' perception of difficulties or obstacles in using IT for teaching, 49% of the teachers agreed or strongly agreed that the use of IT increased teaching workload. 46% of them agreed or strongly agreed that the design of general classrooms was unsuitable for the use of IT in teaching. 35% of them agreed or strongly agreed that their schools lacked concrete and effective schemes to promote ITEd. 34% of them agreed or strongly agreed that students' concentration would be distracted when using computers for individual or small-group learning (Table 6.33, [P5]TQ16g-j).

A statistically significant increase was observed in teachers' levels of agreement to the following statements in MS2: "it saves time and is convenient to use IT" (from 61% to 65%), "the use of IT can provide immediate feedback to students in their learning" (from 52% to 56%), "the use of IT facilitates effective planning and management of teaching process" (from 55% to 57%), "the use of IT can strengthen the relationship between teachers and students" (from 36% to 40%) and "students' concentration will be distracted when using computers for individual or small-group learning" (from 34% to 37%). A statistically significant decrease was spotted in MS2 for teachers' level of agreement to the statement of "the design of general classrooms is unsuitable for the use of IT in teaching" (from 46% to 42%).

Teachers tended to be willing to allocate more time to apply IT in teaching

Teachers' belief and attitude towards using IT for learning and teaching could also be reflected by their willingness to allocate more time to apply IT in teaching. In MS1, 51% of the primary school teachers were willing or very willing to allocate more time to apply IT in teaching, with a mean rating of 3.47 (SD:0.67) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. No statistically significant difference was observed in MS2 (Table 6.34, [P5]TQ20).

Table 6.33 Teachers' levels of agreement on the aspects related to the use of IT in teaching ([P5]TQ16a-j)

Aspects related to the use of IT in teaching	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Strongly agree		Agree		Neutral		Disagree				Strongly agree		Agree		Neutral		Disagree		
a. Teaching effectiveness is enhanced with the use of IT	3.94	0.53	1829	179	(10)	1385	(76)	247	(14)	12 (1)	6 (0)	3.93	0.57	1800	211	(12)	1267	(70)	309	(17)	9 (1)	4 (0)	0.369
b. It saves time and is convenient to use IT	3.56	0.81	1826	124	(7)	990	(54)	515	(28)	173 (9)	24 (1)	3.68	0.74	1797	165	(9)	1010	(56)	511	(28)	103 (6)	8 (0)	0.000***
c. The use of IT facilitates the assessment and evaluation of students' learning progress	3.52	0.68	1827	63	(3)	946	(52)	708	(39)	97 (5)	13 (1)	3.57	0.68	1799	91	(5)	938	(52)	680	(38)	84 (5)	6 (0)	0.067
d. The use of IT can provide immediate feedback to students in their learning	3.46	0.69	1828	40	(2)	913	(50)	738	(40)	122 (7)	15 (1)	3.55	0.69	1798	90	(5)	923	(51)	682	(38)	96 (5)	7 (0)	0.000***
e. The use of IT facilitates effective planning and management of teaching process	3.49	0.69	1826	46	(3)	946	(52)	702	(38)	119 (7)	13 (1)	3.56	0.69	1799	92	(5)	937	(52)	668	(37)	95 (5)	7 (0)	0.006**
f. The use of IT can strengthen the relationship between teachers and students	3.17	0.80	1828	32	(2)	628	(34)	831	(45)	298 (16)	39 (2)	3.28	0.77	1799	55	(3)	673	(37)	823	(46)	222 (12)	26 (1)	0.000***
g. Students' concentration will be distracted when using computers for individual or small-group learning	3.13	0.82	1828	45	(2)	591	(32)	772	(42)	396 (22)	24 (1)	3.19	0.80	1798	46	(3)	610	(34)	792	(44)	332 (18)	18 (1)	0.044*
h. The use of IT increases teaching workload	3.38	0.85	1828	112	(6)	784	(43)	635	(35)	281 (15)	16 (1)	3.34	0.83	1796	96	(5)	732	(41)	680	(38)	270 (15)	18 (1)	0.154
i. The design of general classrooms is unsuitable for the use of IT in teaching	3.29	0.93	1828	141	(8)	691	(38)	582	(32)	392 (21)	22 (1)	3.23	0.90	1796	103	(6)	640	(36)	638	(36)	389 (22)	26 (1)	0.025*
j. The school is in lack of concrete and effective scheme to promote ITEd	3.14	0.87	1824	76	(4)	568	(31)	758	(42)	386 (21)	36 (2)	3.11	0.85	1799	67	(4)	524	(29)	776	(43)	397 (22)	35 (2)	0.169

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.34 Teachers' levels of willingness to allocate more time to apply IT in teaching ([P5]TQ20)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option										*P*-value
				Very willing		Willing		Maybe (一般)		Not very willing (不願意)		Totally not willing		
Teachers' level of willingness to allocate more time to apply IT in teaching														
MS1	3.47	0.67	1817	48	(3)	877	(48)	778	(43)	103	(6)	11	(1)	0.401
MS2	3.46	0.65	1781	42	(2)	828	(46)	820	(46)	81	(5)	10	(1)	

Mean: 1="Totally not willing" and 5="Very willing"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.2.4 Teaching with IT

Teachers adopted IT more frequently in English Language and General Studies

When asked to rate the extent to which IT had been adopted in class, as reported in MS1, 22% of the teachers indicated that computers had been used the most frequently in teaching "English Language" and "General Studies". Other more frequently reported subjects were "Chinese Language" (16%), "Mathematics" (14%) and "Computer or Technology Education" (13%). A statistically significant difference was found in MS2. There was a slight increase in Chinese Language (from 16% to 18%), Mathematics (from 14% to 16%) and Putonghua (from 2% to 4%) and a slight decrease in English Language (from 22% to 21%) and General Studies (from 22% to 20%) (Table 6.35, [P5]TQ2).

Table 6.35 The subjects which teachers used computers the most frequently in teaching after the commencement of the 2005/06 and 2006/07school years ([P5]TQ2)

Subjects	Percentage (%)		$\chi^2_{(df=11)}$	*P*-value
	MS1 (N=1830)	MS2 (N=1803)		
English Language	22	21		
General Studies	22	20		
Chinese Language	16	18		
Mathematics	14	16		
Computer/Technology Education	13	11		
Art and Craft	3	4	36.84	0.000***
Library/Reading	3	2		
Putonghua	2	4		
Music	1	2		
Religious Studies	1	0		
Physical Education	0	1		
Others (Please specify: _____)	2	2		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

There was an increase in teachers' use of computers in class

Another aspect of computer usage by teachers is about the frequency and mode of usage in class. It is desirable for teachers to arrange more time for students to use computers in groups on meaningful tasks to construct knowledge. When asked about the use of IT in teaching in MS1, 57% of the teachers used computers in class 1 to 10 times during the week prior to the conduct of the questionnaire survey while 36% reported having used computers in class 11 times or more. The difference between MS1 and MS2 in the frequency of using computer in class was statistically significant. The frequency of teachers using computers in class 1 to 10 times dropped by more than 10% while the frequency of teachers using computers in class 11 times or more increased by 15% in MS2 (Table 6.36, [P5]TQ1).

Table 6.36 The frequency in which teachers used computers in class during the week prior to the conduct of the questionnaire survey ([P5]TQ1)

Frequency	Percentage (%)		$\chi^2_{(df=4)}$	*P*-value
	MS1 (N=1830)	MS2 (N=1803)		
31 times or more	4	4		
21 to 30 times	8	13		
11 to 20 times	24	34	76.92	0.000***
1 to 10 times	57	45		
Nil	7	5		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers used computers the most frequently for explanation and demonstration to the whole class

As for the mode of computer usage, the most frequently reported mode that teachers used computers to conduct teaching in class in MS1 was for explanation and demonstration to the whole class (62% of the teachers rated frequently or very frequently). 15% of the teachers reported to have students working individually with computers frequently or very frequently while above half of the teachers (51%) rarely or never did so. Only 5% of them reported to have students working in groups with computers frequently or very frequently and 74% of the teachers rarely or never conducted teaching in class in this way. A statistically significant increase was observed in the percentages of teachers using computers for explanation and demonstration to the whole class (from 62% to 69%) and having students to work in groups with computers (from 5% to 6%) frequently or very frequently in MS2 (Table 6.37, [P5]TQ3a-c).

Teachers tended to use IT frequently to support students in learning subject knowledge

When looking into the frequency in which teachers used IT to conduct teaching, as reported in MS1, 53% of the teachers reported to have used IT frequently or very frequently to support students in learning subject knowledge. On the other hand, 26% of the teachers reported that they used IT frequently or very frequently to design a learning context to foster students' higher-order thinking capability. 13% of the teachers reported to have used IT to arrange learning in small groups frequently or very frequently. A statistically significant increase in teachers' frequency of using IT to conduct teaching was observed in these three areas in MS2 (60%, 34% and 15% respectively in MS2) (Table 6.38, [P5]TQ4a-c).

Two-thirds of the teachers assigned digital resources for students to learn subject knowledge beyond school hours

It is also important to find out the frequency in which primary school teachers assigned digital resources to students as well as teachers' perception of the usefulness of these resources to students' learning. In MS1, 64% of the surveyed primary school teachers reported having assigned digital resources to students for learning subject knowledge beyond school hours (Table 6.39, [P5]TQ10b). Amongst them, 70% of the teachers assigned digital resources 1 to 4 times during the week prior to the conduct of the questionnaire survey (Table 6.39, [P5]TQ10c). Table 6.39 illustrated that the difference between MS1 and MS2 in the frequency of assigning digital resources by teachers was statistically significant. A slight increase was found in the percentages of teachers assigning digital resources "16 times or above" (from 1% to 2%) in MS2.

Teachers rarely used electronic means to collect students' assignments and assess or respond to students' learning situation

Designing learning activities is just one aspect of the pedagogies in teaching with IT. IT can be used as an effective tool to collect students' assignments, to manage students' learning process, to report assessment results and to give timely feedback to students.

The findings revealed that teachers rarely used electronic ways to assess or respond to students' learning situation (Table 6.40, [P5]TQ6a-g). In MS1, less than 7% of the primary school teachers (2%-6%) used the listed methods frequently or very frequently. The overall low frequency was also reflected in the mean values of these assessment methods or responses. All mean ratings fell in the range of 1.54 to 1.98 (SD: 0.81-0.92) on a scale from 1 to 5 where 1 was 'never' and 5 was 'very frequently'.

As for students, less than 28% of the students in MS1 (15%-27% of P4 and 16%-26% of P6) indicated that their teachers assessed or responded to their learning situation frequently or very frequently through different electronic means. Although the mean ratings were somewhat higher than those reported by the teachers, there was only a very small difference in the mean ratings

amongst the different electronic methods. The means ratings fell in the range of 1.93 to 2.66 (SD: 1.28-1.39) on a scale of 1 to 5 where 1 was ‘never’ and 5 was ‘very frequently’ (Table 6.40, [P6]SQ6a-f).

There was a statistically significant increase in the frequency of teachers using the listed electronic means for assessing or responding to students’ learning situation (MS1: 2%-6%; MS2: 4%-10%). A statistically significant increase in the frequency of teachers’ giving feedback to students through e-mail was also observed among the P4 students (from 17% to 20%). However, there was a statistically significant decrease among the P6 students in the frequency of teachers’ using online test system (from 26% to 20%), e-learning platform records (from 23% to 18%) of the schools to understand students’ learning situation and designing learning activities based on the listed communication methods so as to cater for individual students’ needs.

Table 6.37 Teachers' perceived frequency of the different ways they used computers to conduct teaching in class ([P5]TQ3a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very Frequently		Frequently		Occasionally (間中)		Rarely				Very Frequently		Frequently		Occasionally (間中)		Rarely		Never	
a. Using computer by yourself for explanation and demonstration to the whole class	3.83	1.03	1830	597	(33)	533	(29)	531	(29)	128	(7)	41	(2)	3.99	0.93	1803	647	(36)	592	(33)	475	(26)	70	(4)	19	(1)	0.000***
b. Students working individually with computers	2.52	1.03	1830	89	(5)	184	(10)	618	(34)	642	(35)	297	(16)	2.56	0.96	1803	59	(3)	208	(12)	633	(35)	688	(38)	215	(12)	0.129
c. Students working in groups with computers	1.99	0.90	1830	22	(1)	80	(4)	362	(20)	755	(41)	611	(33)	2.05	0.88	1803	28	(2)	72	(4)	372	(21)	829	(46)	502	(28)	0.010**

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.38 The frequency that teachers used IT to conduct teaching ([P5]TQ4a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very Frequently		Frequently		Occasionally (間中)		Rarely				Very Frequently		Frequently		Occasionally (間中)		Rarely		Never	
a. To support students in learning the subject knowledge	3.57	0.99	1830	353	(19)	616	(34)	630	(34)	187	(10)	44	(2)	3.73	0.92	1803	398	(22)	681	(38)	579	(32)	121	(7)	24	(1)	0.000***
b. To design learning context so as to foster students' higher-order thinking capability	2.96	0.94	1830	104	(6)	360	(20)	820	(45)	443	(24)	103	(6)	3.17	0.94	1803	159	(9)	444	(25)	812	(45)	327	(18)	61	(3)	0.000***
c. To arrange small group learning	2.51	0.93	1830	47	(3)	184	(10)	664	(36)	694	(38)	241	(13)	2.65	0.92	1803	54	(3)	213	(12)	755	(42)	604	(33)	177	(10)	0.000***

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.39 Frequency of teachers assigning digital resources for students to learn subject knowledge beyond school hours during the week prior to the conduct of the questionnaire survey ([P5]TQ10b,c)

	Percentage (%)			*P*-value
	MS1 (N=1830)	MS2 (N=1802)		
Yes	64	62		
No	36	38		0.119[a]
Frequency	**(N=1177)**	**(N=1114)**	$\chi^2_{(df=4)}$	***P*-value**
16 times or above	1	2		
11 to 15 times	3	2		
5 to 10 times	17	16	15.06	0.005**[b]
1 to 4 times	70	70		
Nil	10	10		

[a] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.40 The frequency of electronic means that teachers used for assessing or responding to students' learning situation ([P5]TQ6a-g, [P6]SQ6a-f)

Stakeholder/ Class levels		MS1												MS2												*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option										Mean (1-5)	SD	N	Count (%) of Students choosing the option								
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never	
Teachers	a.	1.98	0.92	1830	11	(1)	80	(4)	451	(25)	604	(33)	684	(37)	2.15	0.99	1803	34	(2)	105	(6)	512	(28)	596	(33)	556	(31)	0.000***
	b.	1.78	0.92	1830	13	(1)	69	(4)	329	(18)	516	(28)	903	(49)	1.98	0.98	1803	31	(2)	88	(5)	393	(22)	594	(33)	697	(39)	0.000***
	c.	1.70	0.85	1830	9	(0)	44	(2)	290	(16)	535	(29)	952	(52)	1.91	0.95	1803	26	(1)	73	(4)	359	(20)	595	(33)	750	(42)	0.000***
	d.	1.61	0.81	1830	3	(0)	47	(3)	222	(12)	511	(28)	1047	(57)	1.76	0.91	1803	23	(1)	61	(3)	253	(14)	587	(33)	879	(49)	0.000***
	e.	1.95	0.98	1830	26	(1)	88	(5)	411	(22)	557	(30)	748	(41)	2.15	1.05	1803	51	(3)	119	(7)	478	(27)	549	(30)	606	(34)	0.000***
	f.	1.54	0.82	1830	9	(0)	50	(3)	185	(10)	425	(23)	1161	(63)	1.65	0.93	1803	27	(1)	65	(4)	217	(12)	437	(24)	1057	(59)	0.001**
	g.	1.77	0.85	1830	12	(1)	50	(3)	282	(15)	645	(35)	841	(46)	1.95	0.93	1803	22	(1)	76	(4)	377	(21)	647	(36)	681	(38)	0.000***
P4	a.	2.66	1.37	1777	250	(14)	237	(13)	429	(24)	377	(21)	484	(27)	2.65	1.36	1953	276	(14)	228	(12)	511	(26)	404	(21)	534	(27)	0.570
	b.	2.43	1.35	1778	200	(11)	186	(10)	410	(23)	368	(21)	615	(35)	2.46	1.36	1954	217	(11)	247	(13)	430	(22)	382	(20)	679	(35)	0.551
	c.	2.34	1.34	1779	178	(10)	197	(11)	337	(19)	408	(23)	659	(37)	2.37	1.34	1950	204	(10)	201	(10)	414	(21)	430	(22)	701	(36)	0.342
	d.	2.06	1.31	1777	145	(8)	149	(8)	262	(15)	340	(19)	881	(50)	2.09	1.29	1951	159	(8)	145	(7)	326	(17)	411	(21)	911	(47)	0.333
	e.	2.11	1.34	1777	174	(10)	129	(7)	276	(16)	342	(19)	856	(48)	2.21	1.37	1947	207	(11)	174	(9)	316	(16)	380	(20)	870	(45)	0.048*
	f.	1.93	1.33	1775	165	(9)	99	(6)	228	(13)	228	(13)	1054	(59)	1.96	1.34	1951	179	(9)	133	(7)	232	(12)	302	(15)	1105	(57)	0.433
P6	a.	2.64	1.29	1947	208	(11)	299	(15)	500	(26)	460	(24)	481	(25)	2.54	1.19	2055	161	(8)	245	(12)	609	(30)	560	(27)	480	(23)	0.020*
	b.	2.47	1.30	1948	183	(9)	263	(14)	450	(23)	449	(23)	602	(31)	2.36	1.21	2054	135	(7)	229	(11)	521	(25)	530	(26)	639	(31)	0.006**
	c.	2.36	1.29	1949	162	(8)	233	(12)	426	(22)	455	(23)	673	(35)	2.28	1.19	2053	118	(6)	208	(10)	492	(24)	549	(27)	686	(33)	0.055
	d.	2.14	1.28	1947	157	(8)	161	(8)	338	(17)	436	(22)	855	(44)	2.10	1.23	2054	132	(6)	168	(8)	376	(18)	472	(23)	907	(44)	0.159
	e.	2.25	1.32	1945	185	(10)	182	(9)	340	(17)	455	(23)	783	(40)	2.26	1.30	2055	170	(8)	221	(11)	388	(19)	477	(23)	800	(39)	0.934
	f.	2.04	1.39	1943	214	(11)	139	(7)	225	(12)	304	(16)	1061	(55)	1.94	1.28	2053	158	(8)	136	(7)	266	(13)	353	(17)	1140	(56)	0.017*

Methods to assess or respond to students' learning situation

a. To understand students' learning progress through the online test system of the school
b. To understand students' learning progress through the e-learning platform[#] records of the school
c. To understand students' learning progress through the opinion section of the e-learning platform
d. To give feedback to students through the forum/chatroom
e. To give feedback to students through Email
f. To give feedback to students through instant messaging system (e.g. ICQ)
g. To design learning activities based on the communication methods stated in (a) to (f) so as to cater for individual students' needs.

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

6.2.5 Confidence in Using IT for Learning and Teaching

Teachers tended to consider themselves as capable of integrating IT into teaching

As indicates in Table 6.41 ([P5]TQ27), teachers perceived themselves as capable of integrating IT into their daily teaching. In MS1, 51% of the primary school teachers considered themselves to be capable or very capable of integrating IT into their daily teaching, with a mean rating of 3.49 (SD:0.70) on a scale of 1 to 5 where 1 was 'totally not capable' and 5 was 'very capable'. No statistically significant difference was observed in MS2.

Table 6.41 Teachers' capabilities of integrating IT into their daily teaching ([P5]TQ27)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable	
Capabilities of integrating IT into their daily teaching									
MS1	3.49	0.70	1822	85 (5)	847 (46)	783 (43)	93 (5)	14 (1)	0.428
MS2	3.51	0.67	1791	75 (4)	864 (48)	764 (43)	79 (4)	9 (1)	

Mean: 1="Totally not capable" and 5="Very capable"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers perceived a higher level of confidence in selecting appropriate digital resources to conduct teaching but they perceived a lower level of confidence in arranging small-group learning as well as building a 'student-centred' learning environment with the use of digital resources

When teachers were asked to rate their levels of confidence in using IT to conduct different teaching-related activities, as reported in MS1, 62% and 58% of the primary school teachers respectively rated themselves as confident or very confident in selecting appropriate digital resources for teaching and using IT to support students in learning the subject knowledge. Levels of confidence in using IT to conduct the following teaching activities were relatively lower: nurturing students' capability in information processing (52% rated themselves as confident or very confident), designing learning context to foster students' higher-order thinking capability (41% rated themselves as confident or very confident), arranging small-group learning (33% rated themselves as confident or very confident) and building a 'student-centred' learning environment with the use of digital resources (29% rated themselves as confident or very confident). The above mean values fell in the range of 3.16 to 3.63 (SD:0.62-0.77) on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident' (Table 6.42, [P5]TQ10f,g,17a-c,19a). Table 6.42 showed a statistically significant increase in the confidence level of teachers in conducting higher level teaching activities such as nurturing students' capability in processing information (from 52% to 55%), designing learning context to foster students' higher-order thinking capability (from 41% to 44%), arranging small-group learning (from 33% to 37%) and building a 'student-centred' learning environment with the use of digital resources (from 29% to 33%) in MS2.

Teachers perceived a higher level of agreement that their teaching could promote students' capability in information search, but they perceived a lower level of agreement that their teaching could promote students' capability in information collation and analysis as well as self-evaluation on learning outcomes

Pedagogical use of IT can be examined through the teachers' perceived effectiveness of promoting students' capability in performing different learning activities. When describing their approaches of using IT in their teaching, as reported in MS1, 64% of the primary school teachers agreed or strongly agreed that their teaching could promote students' capability in "information search". Around 40% of the teachers agreed or strongly agreed that their teaching could promote students' skills in "information selection" (40%) as well as "reporting and presentation" (43%). The lowest ratings were given to the higher level learning activities such as "information collation and analysis" (31%) as well as "self-evaluation on learning outcome" (32%). A statistically significant increase in teachers' perceived effectiveness of their teaching was observed in MS2. They

perceived that their teaching could promote students' capability in "information search" (from 64% to 69%)," information selection" (from 40% to 45%), "information collation and analysis" (from 31% to 39%), "reporting and presentation" (from 43% to 47%) as well as "self-evaluation on learning outcomes" (from 32% to 37%) (Table 6.43, [P5]TQ14a.i-v).

Table 6.42 Teachers' perceived levels of confidence in using IT to conduct different aspects of teaching activities ([P5]TQ10f,g,17a-c,19a)

Ways to use IT to conduct different aspects of teaching activities	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very confident		Confident		Quite confident (一般)		Not confident				Very confident		Confident		Quite confident (一般)		Not confident	
10f. To select appropriate digital resources to conduct teaching	3.63	0.62	1177	47	(4)	680	(58)	415	(35)	31 (3)	4 (0)	3.68	0.60	1114	54	(5)	671	(60)	365	(33)	23 (2)	1 (0)	0.061
17a. To support students in learning the subject knowledge	3.56	0.68	1825	78	(4)	981	(54)	667	(37)	86 (5)	13 (1)	3.59	0.66	1793	76	(4)	997	(56)	642	(36)	67 (4)	11 (1)	0.225
10g. To nurture students' capability in processing information	3.49	0.65	1177	32	(3)	573	(49)	513	(44)	54 (5)	5 (0)	3.55	0.62	1114	38	(3)	576	(52)	465	(42)	34 (3)	1 (0)	0.009**
17b. To design learning context so as to foster students' higher-order thinking capability	3.30	0.75	1825	52	(3)	696	(38)	849	(47)	205 (11)	23 (1)	3.37	0.71	1792	52	(3)	740	(41)	843	(47)	141 (8)	16 (1)	0.005**
19a. To build a "student-centred learning" environment with the use of digital resources	3.17	0.67	1824	19	(1)	518	(28)	1064	(58)	207 (11)	16 (1)	3.22	0.68	1784	27	(2)	556	(31)	1008	(57)	174 (10)	19 (1)	0.022*
17c. To arrange small-group learning	3.16	0.77	1822	40	(2)	559	(31)	920	(50)	264 (14)	39 (2)	3.26	0.74	1789	51	(3)	605	(34)	917	(51)	192 (11)	24 (1)	0.000***

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.43 Teachers' perceived levels of agreement on promoting students' capability in performing different learning activities ([P5]TQ14a.i-v)

Learning activities that teachers can promote students' capability in performing	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Strongly agree		Agree		Neutral (一般)		Disagree	Strongly disagree				Strongly agree		Agree		Neutral (一般)		Disagree	Strongly disagree	
i. Information search (e.g. using search engine)	3.67	0.71	1821	149	(8)	1024	(56)	570	(31)	61 (3)	17 (1)	3.74	0.64	1785	142	(8)	1086	(61)	513	(29)	38 (2)	6 (0)	0.010*
ii. Information selection	3.31	0.72	1822	35	(2)	696	(38)	914	(50)	146 (8)	31 (2)	3.40	0.68	1785	55	(3)	743	(42)	865	(48)	113 (6)	9 (1)	0.000***
iii. Information collation and analysis (e.g. using spreadsheet)	3.12	0.78	1822	34	(2)	535	(29)	917	(50)	289 (16)	47 (3)	3.27	0.76	1784	49	(3)	640	(36)	866	(49)	200 (11)	29 (2)	0.000***
iv. Reporting and Presentation (e.g. PowerPoint and website presentation)	3.29	0.82	1823	66	(4)	704	(39)	792	(43)	215 (12)	46 (3)	3.40	0.78	1778	78	(4)	770	(43)	739	(42)	162 (9)	29 (2)	0.000***
v. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)	3.13	0.78	1820	23	(1)	567	(31)	919	(50)	251 (14)	60 (3)	3.23	0.76	1778	32	(2)	626	(35)	885	(50)	193 (11)	42 (2)	0.000***

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.2.6 School Professional Development in ITEd for Teachers

School heads were satisfied with the sufficiency of teachers' ITEd professional development

School professional development is considered as one of the most important factors to promote ITEd in primary schools. It is because effective development programmes are expected to enhance teachers' IT competency and facilitate teachers' development of a positive ITEd perception. In MS1, 80% of school heads were satisfied or very satisfied that teachers received sufficient professional development to enhance the quality of learning and teaching. No statistically significant difference was observed in MS2 (Table 6.44, [P1]HSQ4a).

Table 6.44 School heads' levels of satisfaction with the sufficiency of teachers' ITEd professional development ([P1]HSQ4a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Teachers receive sufficient professional development to enhance the quality of learning and teaching"									
MS1	3.91	0.56	551	65 (12)	375 (68)	110 (20)	1 (0)	0 (0)	0.286
MS2	3.95	0.54	445	51 (11)	322 (72)	70 (16)	2 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

46% of the teachers had participated in the ITEd professional development programmes in MS1 and there was a decrease to 41% in MS2

When teachers were asked about their actual participation in ITEd professional development programmes or activities in the 2004/05 school year, nearly half of the teachers (46%) in MS1 reported to have participated in the programmes or activities. There was a statistically significant decrease in teachers' actual participation in teachers' ITEd professional development programmes or activities in MS2. Around two-fifths (41%) of the teachers reported to have participated in these programmes in the 2005/06 school year (Table 6.45, [P5]TQ22a).

Teachers tended to find the ITEd professional development programmes to be practical and they found that these programmes were quite sufficient (一般)

The teachers were also asked to evaluate the professional development programmes or activities in terms of sufficiency and practicality. In MS1, 26% of the primary school teachers perceived the provision to be sufficient or very sufficient, with a mean rating of 3.10 (SD:0.66) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.46, [P5]TQ22h). 42% of the teachers found the programmes or activities practical or very practical, with a mean rating of 3.40 (SD:0.57) on a scale of 1 to 5 where 1 was 'totally not practical' and 5 was 'very practical' (Table 6.46, [P5]TQ22f). No statistically significant difference was observed in MS2 in practicality level of the professional development programmes or activities but a statistically significant increase was noted in sufficiency level of these programmes or activities (from 26% to 27%) in MS2.

Teachers were positive to the outcomes of ITEd professional development programmes and around half of them anticipated future participation

In MS1, 58% to 70% of the teachers agreed or strongly agreed that the programmes or activities enhanced their IT proficiency (74%), enhanced their capability in using IT for learning and teaching (71%) and increased their interest in IT (58%). No statistically significant difference was noted in MS2 (Table 6.47, [P5]TQ22g.i-iii). 60% of the teachers indicated that they were willing or very willing to join such development programmes or activities, with a mean rating of 3.60 (SD:0.65) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. A statistically significant decrease was noted in the percentages of teachers who were willing or very willing to participate in these programmes in the future (53% saying willing or very willing to do so) in MS2 (Table 6.46, [P5]TQ23).

Teachers' ITEd professional development programmes should focus on the use of new technology in teaching as well as the IT application in subject or cross-curricula and project-based learning and teaching

When looking into teachers' expectations of the themes of professional development programmes or activities (Tables 6.45, [P5]TQ22i), as reported in MS1, the top three commonly selected themes were "using new technology in teaching" (65%),"IT application on subject or cross-curricular teaching" (65%) and "IT application on project-based or cross-curricular learning" (63%). They were followed by "webpage design" (42%), "computer operating skills" (31%) as well as "IT facilities and digital resource management" (31%). As for the modes of professional development programmes or activities, 70% to 75% of the respondents expected these programmes or activities to be conducted more often in the modes of training courses (75%) and workshops (70%) in MS1 (Table 6.45, [P5]TQ22j). A statistically significant decrease was noted in the percentages of the top three teachers' expected themes of ITEd professional development programmes or activities in MS2. They were "using new technology in teaching" (from 65% to 58%), "IT application on subject or cross- curricular teaching" (from 65% to 60%) and "IT application on project-based or cross-curricular learning" (from 63% to 54%). A statistically significant decrease was also observed in MS2 in the percentages of teachers choosing training courses (from 75% to 71%) and workshops (from 70% to 67%) as the expected modes for ITEd professional development programmes or activities in the future.

Table 6.45 Teachers' expectations and actual participation in the themes and modes of ITEd professional development programmes or activities ([P5]TQ22a,c,d,i,j)

Teachers' participation in teachers' ITEd professional development programme/activity	**Percentage (%) of Teachers choosing the options**					
	Expectation			**Actual participation**		
				MS1 (N=1829)	**MS2 (N=1801)**	***P*-value**
YES				46	41	0.000***
NO				54	59	
Themes of ITEd professional development programmes/activities	**MS1 (N=1830)**	**MS2 (N=1972)**	***P*-value**	**MS1 (N=849)**	**MS2 (N=732)**	***P*-value**
Use of new technology in teaching#	65	58	0.000***	-	-	-
IT application on subject/cross-curricular teaching	65	60	0.000***	67	64	0.196
IT application on project-based or cross-curricular learning	63	54	0.000***	40	40	0.880
Webpage design#	42	40	0.161	-	-	-
Basic computer operating skills/Computer operating skills	31	32	0.498	45	45	0.806
IT facilities and digital resource management#	31	28	0.110	-	-	-
Network security	23	22	0.922	22	18	0.050
Programming#	20	21	0.811	-	-	-
Internet communication	-	-	-	31	27	0.073
Others(Please specify: _____)	1	1	0.882	5	3	0.102
Modes of ITEd professional development programmes/activities						
Training courses	75	71	0.002**	70	63	0.003 **
Workshop	70	67	0.025*	67	65	0.133
Special lectures	33	32	0.696	36	33	0.096
Classroom observation and exchanges	23	23	0.804	9	8	0.607
Seminars	22	23	0.426	36	33	0.311
Training camp	7	7	0.513	1	1	0.752
Others(Please specify:_____)	1	0	0.494	0	1	0.316

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; #Themes included in [P5]TQ22i only

Table 6.46 Teachers' levels of sufficiency, practicality and willingness for future participation of the ITEd professional development programmes or activities ([P5]TQ22f,h,23)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very practical	Practical	Slightly practical (一般)	Not practical	Totally not practical	
Levels of practicality Mean: 1="Totally not practical" and 5="Very practical"									
MS1	3.40	0.57	849	8 (1)	350 (41)	467 (55)	22 (3)	2 (0)	0.543
MS2	3.39	0.57	732	8 (1)	288 (39)	416 (57)	19 (3)	1 (0)	
	Mean (1-5)	**SD**	**N**	**Count (%) of Teachers choosing the option**					***P*-value**
				Very sufficient	**Sufficient**	**Quite sufficient (一般)**	**Insufficient**	**Totally Insufficient**	
Levels of sufficiency Mean: 1="Totally insufficient" and 5="Very sufficient"									
MS1	3.10	0.66	1714	10 (1)	421 (25)	1024 (60)	243 (14)	16 (1)	0.014*
MS2	3.15	0.63	1664	10 (1)	429 (26)	1045 (63)	165 (10)	15 (1)	
	Mean (1-5)	**SD**	**N**	**Count (%) of Teachers choosing the option**					***P*-value**
				Very willing	**Willing**	**Maybe (一般)**	**Not very willing (不願意)**	**Totally not willing**	
Levels of willingness for future participation Mean: 1="Totally not willing" and 5="Very willing"									
MS1	3.60	0.65	1821	70 (4)	1024 (56)	658 (36)	58 (3)	11 (1)	0.000***
MS2	3.52	0.65	1791	60 (3)	892 (50)	767 (43)	62 (3)	10 (1)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.2.7 School ITEd Sharing and Collaboration among Teachers

Teachers tended to agree that they would share their teaching experience in using IT or teaching materials with colleagues and the others, but they perceived themselves having a lower level of capability to share their experience in promoting ITEd with the education community

Teachers' ITEd perception can be further illustrated by their involvement and capabilities to work collaboratively and share good practices with other teachers. In MS1, 37% of the primary school teachers indicated that they were incapable or totally incapable of sharing their experience in promoting ITEd with the education community whereas 15% of them rated themselves as capable or very capable to do so, with a mean rating of 2.72 (SD:0.81) on a scale of 1 to 5 where 1 was 'totally not capable' and 5 was 'very capable'. A statistically significant increase was noted in teachers' perceived capability to share their experience in promoting ITEd with the education community (from 15% to 20%) in MS2 (Table 6.48, [P5]TQ29).

When we asked specifically about their views on ITEd collaboration and sharing, there was an evidence of relatively active participation. In MS1, 58% of the primary school teachers agreed or strongly agreed that they would work collaboratively with their colleagues in promoting ITEd and 67% agreed or strongly agreed that they would share their experience on pedagogical use of IT with colleagues and the others. The mean values of these two items were 3.56 (SD:0.69) and 3.68 (SD:0.67) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 6.48, [P5]TQ18a,b). No statistically significant difference was observed in teachers' level of agreement on ITEd collaboration and sharing in MS2.

6.2.8 Areas for Improvement of ITEd Development

Teachers tended to agree that the use of IT increased teaching workload and the design of general classrooms was unsuitable for the use of IT in teaching

Teachers may encounter difficulties or obstacles when using IT in learning and teaching. These concerns should be taken into account the areas for improvement of ITEd development. The perception of the difficulties or obstacles in using IT for teaching as discussed in Section 6.2.3 may indicate some of the obstacles which hinder the development of ITEd. In MS1, nearly half of the teachers (49%) agreed or strongly agreed that the use of IT increased teaching workload. The unsuitable design of general classrooms for the use of IT in teaching was another problem agreed or strongly agreed by 46% of the teachers. 34% of them agreed or strongly agreed that students' concentration would be distracted when using computers for individual or small-group learning. Lack of direction and understanding of how IT fits into the overall education policy was another factor affecting the effective use of IT. 35% of them agreed or strongly agreed that their schools lacked concrete and effective scheme to promote ITEd. A statistically significant increase was noted in teachers' level of agreement in the aspects of "students' concentration will be distracted when using computers for individual or small-group learning" (from 34% to 37%), but a statistically significant decrease was spotted in MS2 for the area of "the design of general classrooms is unsuitable for the use of IT in teaching" (from 46% to 42%) (Table 6.33, [P5]TQ16g-j).

Top three areas for improvement of ITEd development in Hong Kong as perceived by teachers were teachers' workload reduction, increase in IT experts or professionals in schools and the provision of digital resources for learning purposes

Teachers put up their views on the areas for improvement of ITEd development in Hong Kong. In MS1, majority of them agreed or strongly agreed that ITEd development could be better if the following could be achieved: increase in IT experts or professionals in schools (86%), increase in the provision of digital resources for learning purposes (86%), increase in IT facilities, digital resources or funding for the development of ITEd in schools (84%) and teachers' ITEd professional development activities or opportunities (81%). In addition, 85% of the surveyed teachers agreed or strongly agreed that workload reduction was another area for improvement of ITEd development in Hong Kong. All of the above items had mean ratings over 4.00 on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 is 'strongly agree'. A statistically significant decrease was observed in all improvement areas for ITEd development in Hong Kong (MS1: 81%-86%; MS2: 76%-81%) in MS2 (Table 6.49, [P5]TQ21a-f).

Table 6.47 Teachers' levels of agreement on the outcomes obtained from the ITEd professional development programmes or activities ([P5]TQ22g.i-iii)

Outcomes obtained from professional development programmes/activities	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						
				Strongly agree	Agree	Neutral	Disagree	Strongly disagree					Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
i. Increase your interest in IT	3.54	0.73	849	41	450 (53)	294 (35)	57 (7)	7	(1)	3.60	0.67	732	35 (5)	407 (56)	255 (35)	33 (5)	2	(0)	0.193
ii. Enhance your IT proficiency	3.78	0.62	849	62	(7) 565 (67)	196 (23)	24 (3)	2	(0)	3.74	0.62	732	46 (6)	470 (64)	197 (27)	17 (2)	2	(0)	0.136
iii. Enhance your capability in using IT for learning and teaching	3.75	0.60	849	53	(6) 549 (65)	227 (27)	19 (2)	1	(0)	3.72	0.61	732	42 (6)	460 (63)	214 (29)	14 (2)	2	(0)	0.323

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.48 Teachers' involvement and capabilities to work collaboratively and share good practices with other teachers ([P5]TQ18a,b,29)

Types of ITEd collaboration and sharing	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						
				Strongly agree	Agree	Neutral	Disagree	Strongly disagree					Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
a. You will work collaboratively with your colleagues in promoting ITEd	3.56	0.69	1825	74	(4) 988 (54)	661 (36)	88 (5)	14	(1)	3.59	0.65	1797	76 (4)	1000 (56)	645 (36)	69 (4)	7	(0)	0.196
b. You will share your teaching experience on using IT or teaching materials with colleagues and the others	3.68	0.67	1823	110	(6) 1105 (61)	528 (29)	70 (4)	10	(1)	3.69	0.64	1793	104 (6)	1089 (61)	546 (30)	48 (3)	6	(0)	0.902
(Mean: 1="Strongly disagree" and 5="Strongly agree")																			
Capabilities of sharing their experience in promoting IT culture with the education community	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						
				Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable					Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable		
Levels of capabilities	2.72	0.81	1812	16	(1) 254 (14)	867 (48)	561 (31)	114	(6)	2.86	0.80	1783	18 (1)	331 (19)	892 (50)	464 (26)	78	(4)	0.000***
(Mean: 1="Totally not capable" and 5="Very capable")																			

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.49 Teachers' views on the areas for improvement of ITEd development in Hong Kong ([P5]TQ21a-f)

Improvement areas	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						
				Strongly agree	Agree	Neutral	Disagree	Strongly disagree					Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
a. Increase IT facilities/digital resources/funding for the development of ITEd in school	4.13	0.71	1829	563	(31) 968 (53)	274 (15)	19 (1)	5	(0)	4.01	0.70	1799	426 (24)	995 (55)	356 (20)	20 (1)	2	(0)	0.000***
b. Increase IT experts/professionals in school	4.17	0.68	1828	583	(32) 990 (54)	240 (13)	11 (1)	4	(0)	4.05	0.68	1798	444 (25)	1012 (56)	324 (18)	17 (1)	1	(0)	0.000***
c. Increase the provision of digital resources for learning purposes	4.15	0.69	1826	563	(31) 996 (55)	250 (14)	10 (1)	7	(0)	4.02	0.68	1795	406 (23)	1035 (58)	336 (19)	17 (1)	1	(0)	0.000***
d. Increase teachers' ITEd professional development activities/opportunities	4.04	0.71	1825	453	(25) 1022 (56)	320 (18)	22 (1)	8	(0)	3.93	0.69	1793	331 (18)	1040 (58)	391 (22)	28 (2)	3	(0)	0.000***
e. Reduce teachers' workload so that they can have more time to develop ITEd	4.30	0.79	1825	866	(47) 685 (38)	239 (13)	26 (1)	9	(0)	4.14	0.78	1799	653 (36)	785 (44)	332 (18)	24 (1)	5	(0)	0.000***
f. Others (Please specify: _____)	3.20	0.91	171	14	(8) 35 (20)	106 (62)	3 (2)	13	(8)	3.27	0.91	226	20 (9)	56 (25)	132 (58)	2 (1)	16	(7)	0.310

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.3 Enhancing School Leadership for the Knowledge Age

The third strategic goal is "Enhancing school leadership for the knowledge age". The objective of this goal is to equip school heads with leadership capacities so that they can provide teachers with guidance and support for establishing schools' IT culture. The progress made under each of the following areas in this goal is examined:

- School ITEd Plan
- Activities to promote IT culture
- Resources and support
- School professional development in ITEd for school heads
- School heads' willingness to promote ITEd

6.3.1 School ITEd Plan

School heads were satisfied with their school ITEd plans and they perceived the highest level of satisfaction with their school ITEd plans covering the infrastructure requirements of schools

In MS1, as shown in Table 6.50 ([P1]HSQ5a-g), school heads showed high level of satisfaction with their school ITEd plans. 81% of them were satisfied or very satisfied with the ITEd plans which covered the infrastructure requirements of schools. 82% of school heads were satisfied or very satisfied that clear visions and goals were stated in the school ITEd plan while 73% of them were satisfied or very satisfied that the implementation strategies and action plans were clearly listed in the school ITEd plan. 75% of school heads were satisfied or very satisfied that their schools would implement and evaluate the effectiveness of the ITEd plans seriously. 75% of school heads also were satisfied or very satisfied that teachers understood and participated in the school ITEd plan. Around 70% of school heads were satisfied or very satisfied with the ITEd plans which covered the content or measures of integrating IT into learning and teaching (72%) as well as teachers' ITEd professional development (71%). The mean ratings ranged from 3.78 to 3.96 (SD:0.59-0.64) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was noted in school heads' satisfaction level with the aspects related to the school ITEd plans except "clear vision and goal(s) are stated in the school ITEd plan" (from 82% to 79%) and "the school ITEd plan covers the infrastructure requirements of the school" (from 81% to 77%) in MS2.

The most important goal in formulating school ITEd plans was to enhance learning and teaching effectiveness

In relation to the importance of setting different goals in the formulation of the school ITEd plans (Table 6.51, [P2]HQ1a-l), most of school heads regarded enhancing learning and teaching effectiveness (99%), improving students' learning outcomes (97%), fostering students' information literacy including information-processing skills and attitude (94%) and enhancing students' understanding of subject content (94%) as important or very important goals in MS1. The next three important goals were strengthening students' initiative, independence and sense of responsibility in learning (92%), strengthening or developing students' generic skills (88%) and providing suitable learning activities according to individual students' needs (81%). All of the above items had mean ratings greater than 4.00 on a scale from 1 to 5 where 1 represented 'totally not important' and 5 represented 'very important'. Around 70% indicated that integrating related-topics for studies and promoting collaboration amongst different subjects (77%), improving communication and co-operation among schools, parents and community (69%) and promoting learning through assessment (70%) were other important goals, with mean ratings between 3.78 and 3.91 (SD:0.65-0.73) on a scale from 1 to 5 where 1 represented 'totally not important' and 5 represented 'very important'. Two goals which they rated as relatively less

important were meeting the expectations of parents and the community (62%) and providing training to prepare students for further studies or future careers (58%), with mean ratings of 3.61 (SD:0.79) and 3.67 (SD:0.69) respectively on a scale from 1 to 5 where 1 represented ‘totally not important’ and 5 represented ‘very important’. A statistically significant increase in school heads’ perceived level of the importance of the goal of promoting learning through assessment (from 70% to 77%) in formulating school ITEd plans was observed in MS2.

Table 6.50 School heads' levels of satisfaction with the school ITEd plan ([P1]HSQ5a-g)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied	
a.	3.95	0.59	551	76	(14)	376	(68)	92	(17)	7 (1)	0 (0)	3.81	0.77	445	46	(10)	306	(69)	67	(15)	13 (3)	13 (3)	0.041*
b.	3.80	0.62	551	52	(9)	347	(63)	143	(26)	9 (2)	0 (0)	3.69	0.73	445	26	(6)	291	(65)	99	(22)	21 (5)	8 (2)	0.108
c.	3.96	0.62	551	90	(16)	358	(65)	96	(17)	7 (1)	0 (0)	3.81	0.79	445	55	(12)	291	(65)	71	(16)	17 (4)	11 (2)	0.022*
d.	3.78	0.61	551	47	(9)	342	(62)	155	(28)	7 (1)	0 (0)	3.69	0.71	445	26	(6)	284	(64)	110	(25)	19 (4)	6 (1)	0.200
e.	3.83	0.64	551	64	(12)	336	(61)	143	(26)	8 (1)	0 (0)	3.72	0.73	445	35	(8)	284	(64)	99	(22)	21 (5)	6 (1)	0.131
f.	3.83	0.62	551	58	(11)	351	(64)	134	(24)	8 (1)	0 (0)	3.72	0.74	445	32	(7)	293	(66)	91	(20)	21 (5)	8 (2)	0.119
g.	3.87	0.64	551	74	(13)	342	(62)	127	(23)	8 (1)	0 (0)	3.82	0.76	445	51	(11)	303	(68)	60	(13)	24 (5)	7 (2)	0.851

Aspects related to the school ITEd Plan

a. Clear vision and goal are stated in the school ITEd plan.
b. The school ITEd plan covers the content/measures of integrating IT into teaching and learning.
c. The school ITEd plan covers the infrastructure requirements of the school.
d. The school ITEd plan covers teachers' ITEd professional development.
e. The school ITEd plan clearly lists out implementation strategies and action plans.
f. The school will implement and evaluate the effectiveness of the ITEd plan seriously.
g. Teachers understand and participate in the school ITEd plan.
Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.51 School heads' perception of the importance of different goals in formulating school ITEd plan ([P2]HQ1a-l)

Goals	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very important		Important		Quite important (一般)		Not important				Very important		Important		Quite important (一般)		Not important		Totally not important	
a.	4.38	0.57	539	225	(42)	294	(55)	18	(3)	2 (0)	0 (0)	4.41	0.57	440	197	(45)	228	(52)	14	(3)	1 (0)	0 (0)	0.341
b.	4.53	0.54	539	294	(55)	235	(44)	11	(2)	1 (0)	0 (0)	4.56	0.52	440	254	(58)	180	(41)	4	(1)	0 (0)	0 (0)	0.297
c.	4.22	0.55	539	151	(28)	355	(66)	32	(6)	1 (0)	0 (0)	4.29	0.53	440	143	(33)	280	(64)	17	(4)	0 (0)	0 (0)	0.060
d.	4.28	0.62	539	195	(36)	303	(56)	37	(7)	4 (1)	0 (0)	4.28	0.58	440	152	(35)	258	(59)	30	(7)	0 (0)	0 (0)	0.769
e.	4.16	0.64	539	156	(29)	318	(59)	61	(11)	4 (1)	0 (0)	4.17	0.61	440	125	(28)	266	(60)	49	(11)	0 (0)	0 (0)	0.934
f.	4.02	0.65	539	114	(21)	326	(60)	94	(17)	5 (1)	0 (0)	4.04	0.60	440	87	(20)	283	(64)	69	(16)	1 (0)	0 (0)	0.774
g.	3.61	0.79	539	56	(10)	259	(48)	192	(36)	24 (4)	8 (1)	3.68	0.80	440	58	(13)	215	(49)	136	(31)	29 (7)	2 (0)	0.212
h.	3.91	0.65	539	81	(15)	336	(62)	113	(21)	9 (2)	0 (0)	3.94	0.59	440	61	(14)	295	(67)	81	(18)	3 (1)	0 (0)	0.471
i.	4.26	0.59	539	177	(33)	327	(61)	33	(6)	1 (0)	1 (0)	4.33	0.58	440	168	(38)	247	(56)	25	(6)	0 (0)	0 (0)	0.084
j.	3.78	0.70	539	68	(13)	304	(56)	150	(28)	16 (3)	1 (0)	3.83	0.65	440	55	(13)	261	(59)	117	(27)	7 (2)	0 (0)	0.400
k.	3.82	0.68	539	76	(14)	303	(56)	149	(28)	11 (2)	0 (0)	3.92	0.66	440	73	(17)	265	(60)	95	(22)	7 (2)	0 (0)	0.026*
l.	3.67	0.69	539	47	(9)	288	(53)	185	(34)	17 (3)	2 (0)	3.73	0.67	440	49	(11)	232	(53)	152	(35)	7 (2)	0 (0)	0.262

Goals

a. To improve students' learning outcomes
b. To enhance learning and teaching effectiveness
c. To enhance students' understanding of subject content
d. To strengthen students' initiative, independence and sense of responsibility in learning
e. To strengthen/develop students' generic skills (e.g. analytical skills, creativity, collaboration skills)
f. To provide suitable learning activities according to the needs of individual student
g. To provide training so as to prepare students for further studies/future careers
h. To integrate related topics for studies and promote collaboration amongst different subjects
i. To foster students' information literacy, including information-processing skills and attitude
j. To improve communication and cooperation among school, parents and community
k. To promote learning through assessment
l. To meet the expectations of parents and the community.
Mean: 1="Totally not important" and 5="Very important"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The top priority for school ITEd plans for the 2005/06 and 2006/07 school years was to improve students' use of IT in their learning

When asked about the three most important options to which schools gave priority to when setting ITEd plans for the 2005/06 and 2006/07 school years (Table 6.52, [P2]HQ4), a relatively high percentage of school heads chose the options of improving students' use of IT in their learning (73%) as the highest priority in the development of ITEd plans within their schools in MS1. Other important goals were improving digital resources and the IT infrastructure in schools (57%), strengthening teachers' professional development on ITEd knowledge and its application (48%) as well as promoting the development of ITEd and building up the culture on the use of IT in school (47%). Striving for support from the community to initiate ITEd and encouraging parents' participation in relevant activities (9%) was the lowest priority in school ITEd plans. A statistically significant decrease in percentage was observed in the percentage of school heads choosing the priority of improving digital resources and the IT infrastructure in schools (from 57% to 50%) in MS2.

Table 6.52 The priorities of school ITEd plan for the 2005/06 and 2006/07 school years ([P2]HQ4)

Priorities	Percentage (%)		*P*-value
	MS1 (N=539)	MS2 (N=440)	
To improve students' use of IT in their learning	73	74	0.726
To improve digital resources and the IT infrastructure in school	57	50	0.034*
To strengthen teachers' professional development on ITEd knowledge and its application	48	53	0.185
To promote the development of ITEd and build up the culture on the use of IT in school	47	45	0.643
To improve ITEd curriculum# in school	34	35	0.696
To improve the implementation and evaluation of school ITEd Plan	31	32	0.676
To strive for community support to initiate ITEd and encourage parents' participation in relevant activities	9	10	0.538
Others: (Please specify)	1	1	0.416

Three most important options; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd curriculum refers to the application of IT in learning and teaching in each KLA (including computer/IT curriculum), to develop IT skills, and to foster the development of information literacy (information processing skills and attitude) and generic skills (e.g. collaboration skill and creativity etc.).

Teachers tended to perceive the Computer or IT curriculum as sufficient in supporting teachers to facilitate students' use of IT in learning

When teachers were asked about the adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning, 47% of the primary school teachers in MS1 indicated that it was sufficient or very sufficient, with a mean rating of 3.40 (SD:0.71) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant increase (from 47% to 50%) was observed in MS2 (Table 6.53, [P5]TQ26).

Table 6.53 Teachers' perception of the levels of adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning ([P5]TQ26)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient	
Adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning									
MS1	3.40	0.71	1826	42 (2)	816 (45)	829 (45)	108 (6)	31 (2)	0.023*
MS2	3.47	0.65	1790	46 (3)	840 (47)	819 (46)	73 (4)	12 (1)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers tended to have considerable participation in encouraging teachers to make appropriate use of IT in teaching, but they tended to have some participation in exchanging experience and insight on the use of IT in teaching with other schools/regions/countries when implementing school ITEd plans

The ITEd Team teachers' perceived levels of participation in different tasks when implementing ITEd plans is further explored. In MS1, surveyed ITEd Team teachers reported that they participated in all tasks to some extent with mean ratings of 3.06 to 3.46 (SD:0.91-1.18) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation' (Table 6.54, [P4]ITQ3a-m) except for the task of exchanging experience and insight on the use of IT in teaching with other schools/regions/countries [only 19% having considerable or strong participation and with a mean rating of 2.54 (SD:1.11)]. The three tasks in which most of the ITEd Team teachers rated themselves as having considerable participation or strong participation were encouraging other teachers to make appropriate use of IT in teaching (51%), formulating school-based ITEd plan (50%) and providing ITEd technical support for teachers (49%). Around two-fifths of them had considerable or strong participation in enhancing the fostering of information literacy in Computer/IT curriculum (42%) and across the KLAs (43%). There was no statistically significant difference in MS2 in all the tasks that ITEd Team teachers participated when implementing school ITEd plans.

The two major problems encountered by school heads in the implementation of ITEd plans were teachers' heavy workload and lack of suitable educational software or digital resources while insufficient computer rooms and IT facilities were other problems indicated by school heads

School heads' perceived difficulties or obstacles to the implementation of ITEd plans are reported in Table 6.55 ([P2]HQ3a-l). Among the listed difficulties, the top two problems often or most often encountered by school heads in the implementation of ITEd plans in MS1 were teachers' heavy workload (48%) and the lack of suitable educational software or digital resources (32%). 32% and 29% of school heads respectively perceived that they often or most often encountered the problem of "insufficient computer rooms" and "insufficient IT facilities (e.g. computers and Internet facilities)" when implementing of ITEd plans while 44% and 45% of them respectively perceived that they rarely or never encountered this problem. Around 70% of school heads rarely or never encountered a lack of clear objective in adopting IT in learning and teaching (73%) as well as a lack of a concrete plan to encourage teachers to promote ITEd (66%). A statistically significant decrease was observed in all difficulties in MS2 except the difficulty of "the time which teachers need to prepare teaching materials with IT or participate in related ITEd professional development activities affects their teaching", "the current teachers' professional development programs cannot foster/develop the requisite IT skills for teachers", "the school is in lack of concrete plan to encourage teachers to promote ITEd" and "insufficient technical support in school".

From ITEd Team teachers' point of view, in MS1, the top two difficulties that they frequently or very frequently encountered were insufficient IT facilities and digital resources from the EMB (34%) as well as insufficient time to cope with ITEd Team work (30%) (Table 6.56, [P4]ITQ4a-k). A statistically significant decrease was observed in MS2 in the perceived frequency of the following difficulties: "insufficient IT facilities in school" (from 27% to 25%), "insufficient time to cope with the work of ITEd team" (from 30% to 22%) and "other teachers in school do not have sufficient time to adopt IT in teaching" (from 27% to 21%).

Table 6.54 ITEd Team teachers' perceived levels of participation in different tasks when implementing school ITEd plan ([P4]ITQ3a-m)

Tasks	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option							
				Strong participation		Considerable participation		Some participation (一般)		Little participation		None									
a.	3.44	1.07	334	56	(17)	109	(33)	115	(34)	35	(10)	19	(6)	3.31	1.03	332	39	(12)	108	(33)	120	(36)	47	(14)	18	(5)	0.084
b.	3.28	1.09	334	45	(13)	93	(28)	132	(40)	37	(11)	27	(8)	3.18	1.03	332	34	(10)	85	(26)	142	(43)	48	(14)	23	(7)	0.165
c.	3.34	1.07	334	48	(14)	101	(30)	120	(36)	45	(13)	20	(6)	3.22	1.04	332	36	(11)	94	(28)	133	(40)	46	(14)	23	(7)	0.160
d.	3.30	1.18	334	56	(17)	91	(27)	119	(36)	32	(10)	36	(11)	3.20	1.05	332	36	(11)	89	(27)	136	(41)	47	(14)	24	(7)	0.139
e.	3.46	0.97	334	42	(13)	127	(38)	121	(36)	29	(9)	15	(4)	3.35	0.99	332	36	(11)	116	(35)	124	(37)	40	(12)	16	(5)	0.147
f.	3.45	1.02	334	50	(15)	115	(34)	120	(36)	33	(10)	16	(5)	3.33	1.06	332	40	(12)	119	(36)	106	(32)	46	(14)	21	(6)	0.219
g.	3.15	1.06	334	30	(9)	96	(29)	130	(39)	49	(15)	29	(9)	3.03	1.09	332	26	(8)	83	(25)	138	(42)	44	(13)	41	(12)	0.174
h.	3.12	1.04	334	26	(8)	96	(29)	134	(40)	48	(14)	30	(9)	3.09	1.02	332	26	(8)	82	(25)	146	(44)	51	(15)	27	(8)	0.539
i.	3.10	1.15	334	38	(11)	85	(25)	125	(37)	45	(13)	41	(12)	3.02	1.04	332	22	(7)	84	(25)	136	(41)	58	(17)	32	(10)	0.259
j.	3.06	1.05	334	23	(7)	94	(28)	131	(39)	53	(16)	33	(10)	3.02	1.06	332	20	(6)	91	(27)	136	(41)	46	(14)	39	(12)	0.677
k.	2.54	1.11	334	12	(4)	50	(15)	124	(37)	69	(21)	79	(24)	2.63	1.08	332	16	(5)	48	(14)	123	(37)	87	(26)	58	(17)	0.389
l.	3.27	0.95	334	24	(7)	118	(35)	136	(41)	37	(11)	19	(6)	3.29	0.93	332	27	(8)	111	(33)	139	(42)	41	(12)	14	(4)	0.994
M	3.29	0.91	334	22	(7)	120	(36)	142	(43)	34	(10)	16	(5)	3.30	0.89	332	24	(7)	112	(34)	146	(44)	39	(12)	11	(3)	0.854

Tasks

a. To participate in formulating the school-based ITEd plan in school
b. To set clear objectives and guidelines on IT infrastructure for school
c. To make recommendations to school on the allocation and use of IT facilities and digital resources
d. To co-ordinate all matters related to ITEd in school
e. To encourage teachers to make appropriate use of IT in teaching
f. To provide ITEd technical support to teachers
g. To provide ITEd professional development to teachers
h. To drive the school to become an exemplary model of making use of IT in teaching and learning
i. To explore new technology (e.g. wireless network system) and develop innovative teaching methods
j. To research and evaluate on the effectiveness of ITEd in school
k. To exchange experience and insight on the use of IT in teaching with other schools/regions/countries
l. To enhance the fostering of information literacy (e.g. information-processing skills and attitude) in Computer/IT curriculum
m. To enhance the fostering of information literacy (e.g. information-processing skills and attitude) across the key learning areas

Mean: 1= "None" and 5="Strong participation"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.55 School heads' perceived frequency of difficulties encountered in implementing of ITEd plan ([P2]HQ3a-l)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option								Mean (1-5)	SD	N	Count (%) of School Heads choosing the option								
				Most often		Often		Occasionally (間中)		Rarely					Most often		Often		Occasionally (間中)		Rarely		
a.	3.50	0.87	539	71	(13)	189	(35)	219	(41)	57	(11)	3	(1)	3.31	0.97	440	59	(13)	111	(25)	183	(42)	81	(18)	6	(1)	0.001**
b.	2.55	0.77	539	6	(1)	43	(8)	225	(42)	233	(43)	32	(6)	2.40	0.79	440	6	(1)	26	(6)	146	(33)	223	(51)	39	(9)	0.001**
c.	2.38	0.78	539	4	(1)	32	(6)	183	(34)	265	(49)	55	(10)	2.28	0.76	440	3	(1)	18	(4)	135	(31)	227	(52)	57	(13)	0.049*
d.	2.68	0.86	539	16	(3)	58	(11)	236	(44)	195	(36)	34	(6)	2.68	0.87	440	13	(3)	56	(13)	172	(39)	177	(40)	22	(5)	0.869
e.	2.61	0.90	539	13	(2)	66	(12)	207	(38)	206	(38)	47	(9)	2.53	0.86	440	7	(2)	45	(10)	164	(37)	184	(42)	40	(9)	0.170
f.	2.47	0.82	539	6	(1)	39	(7)	213	(40)	223	(41)	58	(11)	2.34	0.75	440	2	(0)	24	(5)	138	(31)	232	(53)	44	(10)	0.006**
g.	2.10	0.82	539	0	(0)	31	(6)	115	(21)	269	(50)	124	(23)	2.00	0.78	440	2	(0)	15	(3)	77	(18)	231	(53)	115	(26)	0.045*
h.	2.23	0.89	539	3	(1)	47	(9)	130	(24)	249	(46)	110	(20)	2.13	0.80	440	4	(1)	19	(4)	89	(20)	244	(55)	84	(19)	0.080
i.	2.38	0.99	539	15	(3)	51	(9)	163	(30)	207	(38)	103	(19)	2.27	0.92	440	10	(2)	23	(5)	129	(29)	190	(43)	88	(20)	0.071
j.	2.85	1.31	539	78	(14)	97	(18)	127	(24)	138	(26)	99	(18)	2.59	1.24	440	43	(10)	63	(14)	95	(22)	147	(33)	92	(21)	0.002**
k.	2.81	1.24	539	67	(12)	89	(17)	140	(26)	163	(30)	80	(15)	2.62	1.21	440	41	(9)	64	(15)	107	(24)	143	(33)	85	(19)	0.014*
l.	3.10	0.95	539	42	(8)	127	(24)	229	(42)	123	(23)	18	(3)	2.93	0.93	440	21	(5)	93	(21)	179	(41)	128	(29)	19	(4)	0.007**

Difficulties

a. The workload of teachers is so heavy that they cannot afford time to apply IT in their teaching
b. Teachers lack ITEd knowledge/skills in applying IT in teaching
c. Teachers lack interest in using IT
d. The time which teachers need to prepare teaching materials with IT or participate in related ITEd professional development activities affects their teaching
e. The current teachers' professional development programs cannot foster/develop the requisite IT skills for teachers
f. The existing curriculum is not conducive to the use of IT for teaching in class
g. The school does not have a clear objective in adopting IT in teaching and learning
h. The school is in lack of concrete plan to encourage teachers to promote ITEd
i. Insufficient technical support in school
j. Insufficient computer rooms
k. Insufficient IT facilities (e.g. computers and internet facilities)
l. Lacking in suitable educational software/digital resources

Mean: 1= "Never" and 5="Most often"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.56 ITEd Team teachers' perceived frequency of difficulties encountered in promoting ITEd ([P4]ITQ4a-k)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option								Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option							
				Very Frequently		Frequently		Occasionally (間中)		Rarely					Very Frequently		Frequently		Occasionally (間中)		Rarely		
a.	2.65	0.82	334	8	(2)	38	(11)	131	(39)	144	(43)	13	(4)	2.55	0.88	332	8	(2)	33	(10)	122	(37)	139	(42)	30	(9)	0.128
b.	2.21	0.90	334	7	(2)	21	(6)	74	(22)	166	(50)	66	(20)	2.21	0.94	332	7	(2)	26	(8)	70	(21)	156	(47)	73	(22)	0.856
c.	2.50	0.92	334	11	(3)	30	(9)	111	(33)	145	(43)	37	(11)	2.42	0.97	332	12	(4)	33	(10)	83	(25)	158	(48)	46	(14)	0.135
d.	2.91	1.04	334	27	(8)	64	(19)	117	(35)	104	(31)	22	(7)	2.75	1.10	332	25	(8)	56	(17)	99	(30)	115	(35)	37	(11)	0.042*
e.	3.03	1.00	334	30	(9)	71	(21)	122	(37)	100	(30)	11	(3)	2.82	0.99	332	21	(6)	54	(16)	124	(37)	111	(33)	22	(7)	0.011*
f.	2.55	0.92	334	7	(2)	43	(13)	114	(34)	134	(40)	36	(11)	2.46	0.95	332	12	(4)	27	(8)	108	(33)	140	(42)	45	(14)	0.137
g.	2.44	0.93	334	8	(2)	31	(9)	107	(32)	141	(42)	47	(14)	2.38	0.94	332	9	(3)	28	(8)	95	(29)	148	(45)	52	(16)	0.341
h.	2.93	0.94	334	14	(4)	77	(23)	128	(38)	100	(30)	15	(4)	2.78	0.96	332	18	(5)	53	(16)	116	(35)	128	(39)	17	(5)	0.021*
i.	2.65	0.82	334	5	(1)	42	(13)	137	(41)	132	(40)	18	(5)	2.67	0.91	332	13	(4)	39	(12)	128	(39)	129	(39)	23	(7)	0.962
j.	2.47	0.82	334	4	(1)	26	(8)	127	(38)	144	(43)	33	(10)	2.49	0.90	332	8	(2)	34	(10)	106	(32)	150	(45)	34	(10)	0.929
k.	3.22	0.94	334	35	(10)	81	(24)	147	(44)	65	(19)	6	(2)	3.19	1.01	332	40	(12)	79	(24)	127	(38)	77	(23)	9	(3)	0.666

Difficulties

a. The school does not have a clear direction in developing ITEd
b. The school is not enthusiastic enough in promoting ITEd
c. The school is in lack of implementation plan which co-ordinates the work of the ITEd team
d. There are insufficient IT facilities in school
e. I do not have sufficient time to cope with the work of ITEd team
f. My IT knowledge/skills is/are inadequate to deal with work of ITEd team
g. Other team members lack a sense of involvement in ITEd works
h. Other teachers in school do not have sufficient time to adopt IT in teaching
i. Teachers generally lack knowledge/skills in applying IT in teaching
j. Teachers generally lack interest in using IT in teaching
k. There are insufficient IT facilities and digital resources from Education and Manpower Bureau

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.3.2 Activities to Promote IT Culture

School heads were satisfied with the collaborative team work and sharing among teachers in the use of IT for teaching in schools

69% of them were satisfied or very satisfied that their schools continuously promoted collaborative team work and sharing among teachers in the use of IT for teaching in MS1. There was no statistically significant difference between MS1 and MS2 (Table 6.57, [P1]HSQ8d).

Table 6.57 School heads' levels of satisfaction with IT culture in schools ([P1]HSQ8d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school continuously promotes collaborative team work and sharing among teachers on the use of IT for teaching."									
MS1	3.76	0.66	551	54 (10)	327 (59)	153 (28)	17 (3)	0 (0)	0.548
MS2	3.79	0.60	445	37 (8)	283 (64)	119 (27)	6 (1)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Slightly more than a quarter of schools (28%) organised sharing activities on the use of IT for teaching and 44% of those schools that collaborated with outside parties organised these activities with local schools in MS1

Table 6.58 ([P2]HQ17a-d) reports the situation of sharing activities in the use of IT for teaching in primary schools. In MS1, 28% of school heads indicated that their schools had organised sharing activities for pedagogical use of IT in the 2004/05 school year ([P2]HQ17a). Amongst the 54% of school heads who had organised the sharing activities with outside parties ([P2]HQ17b), 44% organised with local primary, secondary and special schools, 41% with local community or commercial organisations, 35% with the EMB and 30% with local tertiary institutions ([P2]HQ17c). The sharing activities were conducted in the forms of workshops (57%), training courses (42%), seminars (38%) and school visits (38%). Only 26% of the schools provided online Internet resources for sharing with other schools and 11% participated in "teacher sharing forum" at the HKEdCity ([P2]HQ17d). No statistically significant difference was observed in MS2.

Table 6.58 School heads' reported on the sharing activities on the use of IT for teaching in their schools in the 2004/05 and 2005/06 school years ([P2]HQ17a-d)

Sharing activities	Percentage (%)		*P*-value
	MS1 (N=523)	MS2 (N=410)	
YES	28	31	0.214
NO	72	69	
Collaboration with other organisations	**(N=145)**	**(N=129)**	
YES	54	55	0.927
NO	46	45	
Organisations	**(N=79)**	**(N=71)**	
Local primary, secondary, and special schools	44	34	0.190
Local community/commercial organisations	41	42	0.829
Education and Manpower Bureau	35	31	0.564
Local tertiary institutions	30	37	0.420
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	13	21	0.166
Oversea schools/community organisations/commercial organisations/tertiary institutions	5	3	0.485
Experience sharing activities	**(N=145)**	**(N=129)**	
Arranged workshop	57	61	0.592
Arranged training courses	42	40	0.695
Arranged seminars	38	32	0.251
Arranged school visits	38	29	0.106
Provided online Internet resources for sharing with other schools	26	35	0.138
Participated in the activities of "Teacher sharing forum" at HKEdCity	11	10	0.798
Issued publications	6	8	0.476

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.3.3 Resources and Support

School heads were satisfied that their schools made appropriate use of resources

In MS1, 84% of school heads were satisfied or very satisfied that their schools made appropriate use of IT facilities and digital resources from the EMB, the Quality Education Fund and other sources. There was no statistically significant difference between MS1 and MS2 (Table 6.59, [P1]HSQ6j).

Table 6.59 School heads' levels of satisfaction with the use of resources ([P1]HSQ6j)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school makes appropriate use of IT facilities and digital resources from Education and Manpower Bureau, Quality Education Fund and other sources."									
MS1	4.07	0.64	551	129 (23)	338 (61)	79 (14)	5 (1)	0 (0)	0.529
MS2	4.10	0.59	445	95 (21)	304 (68)	42 (9)	3 (1)	1 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Around half of the schools received funding from the Quality Education Fund for IT-related projects

In order to provide resources and support for the implementation of school ITEd plan, primary schools might need ITEd grants or funding from various sources. In MS1, schools received funding from the Quality Education Fund for IT-related projects (49%), Millennium Multi-media Classrooms Project (14%) and from other parties (8%). No statistically significant difference was identified in MS2 (Table 6.60, [P3]ITEdInfoQ2a).

Table 6.60 Types of ITEd funding received by schools ([P3]ITEdInfoQ2a,b)

ITEd Funding	Percentage (%)		*P*-value
	MS1 (N=549)	MS2 (N=435)	
a. Quality Education Fund:			
- IT-related Projects [excluding Information Technology Co-ordinator (ITC), Multi-media Learning Centre (MMLC) and Matching Fund*]	49	48	0.682
- Millennium Multi-media Classrooms Project (千禧多媒體課室計劃)	14	13	0.881
b. Others	8	7	1.000

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

* Enhancement of IT facilities/services in school (matching fund)

School heads tended to be satisfied with the current funding model of the "Composite Information Technology Grant" and ITEd Team Teachers were quite satisfied (一般) with this model

In MS1, 47% of school heads and 32% of the ITEd Team teachers were satisfied or very satisfied with the current funding model of the "Composite Information Technology Grant" (CITG) provided by the Government to support ITEd, with mean ratings of 3.36 (SD:0.82) and 3.10 (SD:0.67) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was identified in the satisfaction level of school heads in MS2, but a statistically significant decrease (from 32% to 22%) was spotted in MS2 for the satisfaction level of the ITEd Team teachers (Table 6.61, [P2]HQ5, [P4]ITQ6).

Table 6.61 School heads' and ITEd Team teachers' levels of satisfaction to the current funding model of "Composite Information Technology Grant" (CITG) provided by the Government to support ITEd ([P2]HQ5, [P4]ITQ6)

Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option					P-value
					Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
School heads	MS1	3.36	0.82	539	22 (4)	230 (43)	222 (41)	50 (9)	15 (3)	0.907
	MS2	3.35	0.79	440	11 (3)	199 (45)	172 (39)	49 (11)	9 (2)	
ITEd team teachers	MS1	3.10	0.67	334	5 (1)	102 (31)	168 (50)	47 (14)	12 (4)	0.019*
	MS2	3.00	0.74	332	3 (1)	69 (21)	197 (59)	50 (15)	13 (4)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.3.4 School Professional Development in ITEd for School Heads

School professional development programmes, such as IT leadership training for school principals organised by the EMB, help school heads to develop their positive perception of ITEd and empower them to build their knowledge, skills and understanding of learning and teaching with IT.

Around two-fifths of school heads participated in ITEd professional development programmes or activities

In MS1, around two-fifths of school heads (41%) reported having participated in ITEd professional development programmes or activities specifically organised for school heads. No statistically significant difference was noted in MS2 (Table 6.62, [P2]HQ18a).

"Using IT in school administration or managerial work" was the major theme that school heads expected for ITEd professional development programmes or activities

When asked about their expectation of the themes of ITEd professional development programmes or activities (Table 6.62, [P2]HQ18c), 71% of school heads in MS1 considered that using IT in school administration or managerial work should be included in these programmes. The next two themes were the formulation of school-based ITEd plan (58%) and using new technology in teaching (50%). Less than half of the respondents indicated that the themes of IT facilities and digital resources management (47%) as well as using IT in subject or cross-curricular teaching (42%) should be incorporated. The theme of computer operation skills was selected by the lowest proportion of respondents amongst the specified themes (16%). As for the modes of professional development programmes or activities, the three most desirable modes rated by school heads in MS1 were "training courses" (76%), "workshops" (70%) and "school visits" (54%). Training camps (14%) was the least preferable mode amongst the specified modes (Table 6.62, [P2]HQ18d). No statistically significant difference was identified in school heads' expectations of the themes and modes for ITEd professional development programmes or activities in MS2.

Table 6.62 School heads' expectations of the themes and modes as well as participation in ITEd professional development programmes or activities ([P2]HQ18a,c,d)

School heads' participation in school heads' ITEd professional development programme/activity	**Percentage (%)**		***P*-value**
	MS1 (N=537)	**MS2 (N=413)**	
YES	41	38	0.300
NO	59	62	
Themes of ITEd professional development programmes/activities	**Expectation (N=539)**	**Expectation (N=423)**	
Use of IT in school administration/management work	71	72	0.817
Formulation of school-based ITEd plan	58	53	0.142
Use of new technology in teaching	50	54	0.219
IT facilities and digital resources management	47	45	0.470
Use of IT in subject/cross-curricular teaching	42	38	0.125
Computer operation skills	16	14	0.417
Others (Please specify)	0	0	0.110
Modes of ITEd professional development programmes/activities	**Expectation (N=539)**	**Expectation (N=423)**	
Training courses	76	71	0.060
Workshops	70	76	0.054
School visits	54	55	0.767
Special lectures	43	44	0.830
Seminars	40	34	0.072
Training camps	14	16	0.491
Others (Please specify)	0	0	1.000

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

School heads considered ITEd professional development programmes as effective in helping their teaching, administration and managerial work

In MS1, 72% of school heads reported the ITEd professional development programmes as effective or very effective in helping their teaching, administration and managerial work, with a mean rating of 3.74 (SD:0.58) on a scale of 1 to 5 where 1 was 'totally not effective' and 5 was 'very effective'. No statistically significant difference was observed in MS2 (Table 6.63, [P2]HQ18b).

Table 6.63 School heads' perception of the effectiveness of the ITEd professional development programmes or activities ([P2]HQ18b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very effective	Effective	Quite effective (一般)	Not very effective	Totally not effective	
MS1	3.74	0.58	222	11 (5)	148 (67)	58 (26)	5 (2)	0 (0)	0.543
MS2	3.77	0.55	157	6 (4)	113 (72)	34 (22)	4 (3)	0 (0)	

Mean: 1="Totally not effective" and 5="Very effective"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.3.5 School Heads' Willingness to Promote ITEd

School heads were willing to allocate more time to promote ITEd

As school heads play a leading role in the promotion of ITEd in schools, their levels of willingness to allocate more time in this respect is surveyed. In MS1, it was found that 86% of school heads were willing or very willing to do so, with a mean rating of 3.98 (SD:0.53) on a scale of 1 to 5 where 1 was 'not willing at all' and 5 was 'very willing' There was no statistically significant difference between MS1 and MS2 on the level of school head's willingness to allocate more time to promote ITEd (Table 6.64, [P2]HQ6). This is an indication of positive perception of ITEd.

Table 6.64 School heads' levels of willingness to allocate more time to promote ITEd ([P2]HQ6)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very willing	Willing	Quite willing (一般)	Not willing	Not willing at all	
MS1	3.98	0.53	539	66 (12)	399 (74)	70 (13)	4 (1)	0 (0)	0.503
MS2	3.95	0.51	440	43 (10)	338 (77)	55 (13)	4 (1)	0 (0)	

Mean: 1="Totally not effective" and 5="Very effective"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.4 Enriching Digital Resources for Learning

The fourth strategic goal is "Enriching digital resources for learning". This strategy aims to continually enrich quality digital education resources to meet schools' needs and develop the digital resource repository with effective knowledge management strategies to facilitate learning, teaching and sharing among teachers, parents, students and other schools.

The usefulness of digital resources with respect to meeting the learning and teaching needs is reflected by the types of digital resources that are available, the frequency of usage and the ways in which these resources are managed. The following aspects will be examined:

- Sources of digital resources
- Digital resources repository

6.4.1 Sources of Digital Resources

School heads were satisfied that their schools acquired up-to-date digital resources for teachers and students' use

School heads' levels of satisfaction with enriching digital resources for learning is presented in Table 6.65 ([P1]HSQ6a-c). In MS1, more than two-thirds of school heads (68%) were satisfied or very satisfied with the acquisition of up-to-date digital resources for teachers' and students' use. Around 50% of school heads were satisfied or very satisfied that their schools developed quality school-based digital resources and a repository of online resources for all KLAs (53%) and derived an effective digital resource management mechanism to facilitate learning and teaching as well as sharing among teachers, parents and students (47%). The mean ratings of these three items fell in the range of 3.45 to 3.76 (SD:0.72-0.76) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. A statistically significant increase was identified in the satisfaction level in all aspects related to enriching digital resources for learning in MS2. These aspects were: acquisition of up-to-date digital resources for teachers' and students' use (from 68% to 74%), development of quality school-based digital resources and a repository of online resources for all KLAs (from 53% to 59%) as well as development of an effective digital resource management mechanism to facilitate learning and teaching as well as sharing among teachers, parents and students (from 47% to 60%).

School heads considered the digital resources from the HKEdCity as the most important source

School heads' perception of the importance of different sources of digital resources is presented in Table 6.66 ([P2]HQ9a-j). In MS1, the two most important sources of digital resources for learning and teaching were those from the HKEdCity (89%) and free resources downloaded from the Internet (except the HKEdCity) (80%). Around 70% of school heads indicated that the digital resources obtained from the Quality Education Fund (72%) as well as digital resources purchased by schools (70%) and purchased by means of the electronic Learning Credits scheme (70%) as important or very important. 33% to 52% of them considered the digital resources purchased by or obtained via community resources (52%), produced by teachers (36%) and purchased from the funding of the sponsoring body (33%) as important or very important. All of the above items had mean ratings ranged from 3.11 to 4.13 (SD:0.61-0.99) on a scale of 1 to 5 where 1 was 'totally not important' and 5 was 'very important'. A statistically significant increase was noted in the percentages of school heads who considered digital resources purchased by means of the "electronic Learning Credits" (from 70% to 80%) as important or very important whereas a statistically significant decrease was noted in those purchased by parents (from 27% to 22%) in MS2.

The most common digital resources which teachers used frequently or very frequently were those provided by textbook publishers

When looking at the frequency of teachers using different digital resources (Table 6.67, [P5]TQ10a.i-xi), the most common resources which teachers used frequently or very frequently were provided by textbook publishers (61%), as reported in MS1. It was followed by resources purchased by their schools (34%) and free resources downloaded from the Internet (30%). All other digital resources were frequently or very frequently used by less than 29% of the primary school teachers, with mean ratings less than 3.00 on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. 17% to 28% of the teachers frequently or very frequently used the digital resources from the HKEdCity (28%), the digital resources developed by themselves (20%), and the EMB (17%). Less that 11% of the respondents frequently or very frequently used the digital resources developed by the tertiary institutions (8%) and other government departments or voluntary organisations (10%). A statistically significant increase in the usage of digital resources provided by textbook publishers (from 61% to 70%) was identified in MS2. Usage of all other digital resources except "others" also significantly increased statistically in MS2 (MS1: 8%-34%; MS2: 10%-43%). Usage of the digital resources such as those from the HKEdCity (from 28% to 31%), the EMB (from 17% to 20%) and the community (MS1:8%-10%; MS2: 10%-14%) significantly increased statistically in MS2.

Table 6.65 School heads' levels of satisfaction with enriching digital resources for learning ([P1]HSQ6a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		
a.	3.50	0.75	551	37	(7)	252	(46)	215	(39)	46 (8)	1 (0)	3.63	0.70	445	38	(9)	223	(50)	169	(38)	13 (3)	2 (0)	0.010*
b.	3.45	0.72	551	30	(5)	233	(42)	245	(44)	43 (8)	0 (0)	3.64	0.66	445	31	(7)	238	(53)	163	(37)	12 (3)	1 (0)	0.000***
c.	3.76	0.76	551	76	(14)	295	(54)	152	(28)	26 (5)	2 (0)	3.89	0.70	445	78	(18)	248	(56)	114	(26)	3 (1)	2 (0)	0.010*

Aspects related to enriching digital resources for learning

a. The school has developed quality school-based digital resources and a repository of online resources for all key learning areas (KLAs).

b. The school has derived an effective mechanism for digital resource management to facilitate learning and teaching as well as sharing among teachers, parents and students.

c. The school from time to time acquires up-to-date digital resources for teachers'/students' use.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.66 School heads' perception of the importance of different sources of digital resources for learning and teaching ([P2]HQ9a-j)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very important		Important		Quite important (一般)		Not important	Totally not important				Very important		Important		Quite important (一般)		Not important	Totally not important	
a.	3.24	0.72	539	14	(3)	176	(33)	279	(52)	66 (12)	4 (1)	3.17	0.82	440	19	(4)	123	(28)	221	(50)	67 (15)	10 (2)	0.141
b.	3.98	0.64	539	99	(18)	336	(62)	99	(18)	5 (1)	0 (0)	3.91	0.64	440	67	(15)	271	(62)	98	(22)	4 (1)	0 (0)	0.078
c.	4.13	0.61	539	138	(26)	337	(63)	61	(11)	3 (1)	0 (0)	4.06	0.66	440	102	(23)	266	(60)	68	(15)	3 (1)	1 (0)	0.087
d.	3.85	0.73	539	95	(18)	281	(52)	150	(28)	13 (2)	0 (0)	3.92	0.68	440	79	(18)	252	(57)	103	(23)	6 (1)	0 (0)	0.142
e.	3.85	0.74	539	94	(17)	286	(53)	145	(27)	12 (2)	2 (0)	4.01	0.70	440	98	(22)	256	(58)	78	(18)	7 (2)	1 (0)	0.001***
f.	2.93	0.97	539	24	(4)	124	(23)	223	(41)	128 (24)	40 (7)	2.84	0.98	440	19	(4)	86	(20)	179	(41)	119 (27)	37 (8)	0.123
g.	3.00	0.88	539	17	(3)	132	(24)	251	(47)	113 (21)	26 (5)	2.90	0.89	440	14	(3)	84	(19)	210	(48)	106 (24)	26 (6)	0.046*
h.	3.11	0.95	539	33	(6)	144	(27)	239	(44)	93 (17)	30 (6)	3.06	0.96	440	26	(6)	111	(25)	192	(44)	85 (19)	26 (6)	0.417
i.	3.41	0.99	539	58	(11)	221	(41)	171	(32)	62 (12)	27 (5)	3.33	0.89	440	28	(6)	173	(39)	170	(39)	55 (13)	14 (3)	0.085
j.	3.85	0.89	539	122	(23)	263	(49)	108	(20)	41 (8)	5 (1)	3.73	0.93	440	80	(18)	217	(49)	101	(23)	30 (7)	12 (3)	0.067

Sources of digital resources for learning and teaching in school

a. Digital resources produced by teachers

b. Free digital resources downloaded from the Internet (except HKEdCity)

c. Digital resources from HKEdCity

d. Digital resources purchased by the school

e. Digital resources purchased by means of the "Electronic Learning Credit"

f. Digital resources purchased from parents' donations

g. Digital resources purchased by parents

h. Digital resources purchased from the funding of the sponsoring body

i. Digital resources purchased by/obtained via community resources (e.g. publishers and IT industries)

j. Digital resources obtained from Quality Education Fund

Mean: 1= "Totally not important" and 5="Very important; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.67 Teachers' frequency in using different digital resources ([P5]TQ10a.i-xi)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option								Mean (1-5)	SD	N	Count (%) of Teachers choosing the option								
				Very Frequently		Frequently		Occasionally (間中)		Rarely					Very Frequently		Frequently		Occasionally (間中)		Rarely		
i.	2.68	1.06	1829	102	(6)	263	(14)	666	(36)	535	(29)	263	(14)	2.77	1.03	1802	98	(5)	294	(16)	704	(39)	506	(28)	200	(11)	0.004**
ii.	2.68	0.94	1830	46	(3)	269	(15)	762	(42)	554	(30)	199	(11)	2.79	0.95	1802	57	(3)	315	(17)	787	(44)	472	(26)	171	(9)	0.000***
iii.	3.20	0.87	1830	99	(5)	539	(29)	886	(48)	237	(13)	69	(4)	3.37	0.89	1802	168	(9)	616	(34)	786	(44)	182	(10)	50	(3)	0.000***
iv.	2.96	0.94	1830	69	(4)	431	(24)	803	(44)	403	(22)	124	(7)	3.11	0.93	1802	116	(6)	449	(25)	850	(47)	293	(16)	94	(5)	0.000***
v.	3.03	0.94	1829	86	(5)	461	(25)	821	(45)	348	(19)	113	(6)	3.14	0.95	1802	132	(7)	460	(26)	827	(46)	292	(16)	91	(5)	0.002**
vi.	2.74	0.87	1829	38	(2)	270	(15)	837	(46)	552	(30)	132	(7)	2.86	0.89	1802	61	(3)	300	(17)	875	(49)	449	(25)	117	(6)	0.000***
vii..	2.55	0.87	1829	27	(1)	171	(9)	788	(43)	637	(35)	206	(11)	2.67	0.88	1802	35	(2)	212	(12)	848	(47)	531	(29)	176	(10)	0.000***
viii.	2.31	0.89	1829	21	(1)	129	(7)	588	(32)	749	(41)	342	(19)	2.45	0.91	1800	31	(2)	148	(8)	694	(39)	648	(36)	279	(16)	0.000***
ix.	3.70	1.01	1829	424	(23)	702	(38)	489	(27)	160	(9)	54	(3)	3.92	0.95	1801	558	(31)	695	(39)	422	(23)	97	(5)	29	(2)	0.000***
x.	2.77	0.92	1829	49	(3)	294	(16)	854	(47)	458	(25)	174	(10)	2.89	0.94	1802	71	(4)	344	(19)	847	(47)	388	(22)	152	(8)	0.000***
xi.	1.77	1.08	82	2	(2)	3	(4)	19	(23)	8	(10)	50	(61)	1.98	1.24	112	5	(4)	9	(8)	27	(24)	9	(8)	62	(55)	0.272

Digital resources

i. Resources developed by yourself
ii. Resources developed by your school
iii. Resources purchased by your school
iv. HKEdCity
v. Free resources downloaded from the Internet
vi. Resources developed by Education and Manpower Bureau
vii. Resources provided by other government department(s)/voluntary organisation(s)
viii. Tertiary institution(s)
ix. Resources provided by textbook publisher(s)
x. Resources developed by other software vendor(s)
xi. Others (Please specify: _____)

Mean: 1= "Totally not important" and 5="Very important; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common digital resources assigned for students as reported by teachers were those free resources downloaded from the Internet while students used various sources of digital resources for their self-learning

Table 6.68 ([P5]TQ10d) shows the sources of digital resources assigned by teachers for students to learn subject knowledge beyond school hours. The most common digital resources assigned for students as reported by teachers in MS1 were free resources downloaded from the Internet (except the HKEdCity) (55%), followed by the digital resources from the HKEdCity (42%). Only 15% of the teachers assigned self-made digital resources. No statistically significant difference was identified in MS2.

Students were asked to indicate the sources of digital resources that they used on their own initiative for self-learning beyond school hours (Table 6.68 ([P6]SQ11c). In MS1, it was found that an average of 21% to 25% of P4 and P6 students used free digital resources downloaded from the Internet (except the HKEdCity), digital resources purchased by schools and digital resources from the HKEdCity. 21% of P4 and 23% of P6 students used digital resources from the HKEdCity. Student's practice in using digital resources shows that they search for resources from various sources. A statistically significant increase was observed in the percentages of all types of digital resources that students used on their own initiative for self-learning beyond school hours in MS2 (MS1: P4=17%-23% and P6=17%-25%; MS2: P4=26%-39% and P6=24%-37%).

Table 6.68 Digital resources assigned by teachers for students to learn subject knowledge and used by students on their own initiative for self-learning beyond school hours ([P5]TQ10d, [P6]SQ11c)

Digital Resources	**Percentage (%) choosing the options**								
	Digital resources which students used on their own initiative for self-learning beyond school hours						**Digital resources which teachers assigned students to use for learning subject knowledge beyond school hours**		
	P4			**P6**			**Teachers**		
	MS1 (N=982)	**MS2 (N=993)**	***P*-value**	**MS1 (N=1144)**	**MS2 (N=991)**	***P*-value**	**MS1 (N=1177)**	**MS2 (N=1114)**	***P*-value**
Digital resources purchased by the school	23	29	0.001**	22	31	0.000***	34	36	0.353
Free digital resources downloaded from the Internet (except HKEdCity)	21	33	0.000***	25	33	0.000***	55	52	0.155
Digital resources from HKEdCity	21	39	0.000***	23	37	0.000***	42	44	0.310
Self-made digital resources by the Teachers	17	26	0.000***	17	24	0.000***	15	13	0.253
Others	51	7	0.000***	54	8	0.000***	21	20	0.414

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived that the digital resources assigned by teachers or used on their own initiative beyond school hours were helpful whereas teachers perceived a lower level of helpfulness of digital resources assigned by them for students subject learning

Concerning the helpfulness of digital resources for learning, no matter they were assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours, 68% of P4 and 63% or less of P6 students found them to be helpful or definitely helpful in MS1. The mean ratings fell in the range of 3.69 to 3.87 (SD:0.82-0.87) on a scale of 1 to 5 where 1 was 'definitely not' and 5 was 'yes definitely' (Table 6.69, [P6]SQ10d,11d). Similarly, 62% of the teachers considered the digital resources which they assigned to students to be helpful or definitely helpful for students' learning of the subject content, with a mean rating of 3.61 (SD:0.57) (Table 6.69, [P5]TQ10e). There was no statistically significant difference in students' perceived level of the helpfulness of digital resources assigned by teachers for learning subject knowledge beyond school hour, but a statistically significant increase was noted in those of teachers (from 62% to 66%) in MS2. A statistically significant increase was also identified in students' perceived level of helpfulness for those used on their initiative for self-learning beyond school hours in MS2 (MS1: 63%-68%; MS2: 68%-74%).

Table 6.69 Teachers' and students' perception of the helpfulness of digital resources assigned by teachers for learning subject knowledge/used by students on their own initiative for self-learning beyond school hours ([P5]TQ10e, [P6]SQ10d,11d)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Yes definitely		Yes		Maybe (一般)		No		Definitely not		
Levels of helpfulness of the digital resources assigned by teachers for learning subject knowledge beyond school hours															
P4	MS1	3.86	0.85	882	211	(24)	384	(44)	255	(29)	19	(2)	13	(1)	0.069
	MS2	3.90	0.92	961	249	(26)	451	(47)	201	(21)	37	(4)	24	(3)	
P6	MS1	3.69	0.84	1050	166	(16)	477	(45)	342	(33)	49	(5)	16	(2)	0.100
	MS2	3.76	0.81	980	164	(17)	470	(48)	300	(31)	35	(4)	11	(1)	
Teachers	MS1	3.61	0.57	1177	19	(2)	709	(60)	422	(36)	26	(2)	1	(0)	0.000***
	MS2	3.68	0.53	1114	33	(3)	698	(63)	380	(34)	3	(0)	0	(0)	
Levels of helpfulness of the digital resources used on students' initiative for self-learning beyond school hours															
P4	MS1	3.87	0.87	982	243	(25)	421	(43)	279	(28)	21	(2)	17	(2)	0.005**
	MS2	3.97	0.85	993	278	(28)	456	(46)	223	(22)	22	(2)	15	(1)	
P6	MS1	3.75	0.82	1144	197	(17)	527	(46)	376	(33)	27	(2)	18	(2)	0.046*
	MS2	3.81	0.77	991	165	(17)	509	(51)	284	(29)	24	(2)	9	(1)	

Mean: 1="Definitely not" and 5="Yes definitely"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to consider digital resources in schools as sufficient whereas teachers considered them as quite sufficient (一般) — a statistically significant increase was noted in teachers' perceived level of sufficiency in MS2

With regard to the sufficiency of digital resources (e.g. educational CDs and learning resources from the Internet) in schools, 53% of P4 and 42% of P6 students indicated that it was sufficient or very sufficient, with mean ratings of 3.53 (SD:1.01) and 3.31 (SD:0.98) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' in MS1. There was a statistically significant increase in P6 students' perceived sufficiency level of the digital resources in schools (from 42% to 47%), but there was no statistically significant difference in that of P4 students in MS2 (Table 6.70, [P6]SQ7f). From the teachers' point of view, 41% of the teachers in MS1 considered that the digital resources were sufficient or very sufficient, with a mean rating of 3.17 (SD:1.04). A statistically significant increase was identified in teachers' perceived level in this aspect in MS2 (from 41% to 49%) (Table 6.70, [P5]TQ7g). The findings indicated that students' perceived level of the sufficiency of digital resources in schools was higher than that of the teachers.

Table 6.70 Students' and teachers' perception of the sufficiency of digital resources in schools ([P5]TQ7g, [P6]SQ7f)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
P4	MS1	3.53	1.01	1766	312	(18)	612	(35)	627	(35)	137	(8)	78	(4)	0.145
	MS2	3.59	0.97	1950	336	(17)	761	(39)	641	(33)	145	(7)	66	(3)	
P6	MS1	3.31	0.98	1943	203	(10)	618	(32)	800	(41)	217	(11)	105	(5)	0.000***
	MS2	3.44	0.91	2052	230	(11)	745	(36)	843	(41)	166	(8)	68	(3)	
Teachers	MS1	3.17	1.04	1830	48	(3)	688	(38)	846	(46)	211	(12)	37	(2)	0.000***
	MS2	3.31	1.04	1802	81	(4)	809	(45)	737	(41)	154	(9)	21	(1)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Primary schools were quite in need of increasing or upgrading digital resources as perceived by ITEd Team teachers

In MS1, 70% of the ITEd Team teachers indicated that their schools were quite in need or much in need of increasing or upgrading digital resources, which was the second greatest support needed by the primary schools. There was no statistically significant difference between MS1 and MS2 in this area (Table 6.71, [P4]ITQ5d).

Table 6.71 ITEd Team teachers' perception of the needs of different types of support for teachers and students in school ([P4]ITQ5d)

	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option					*P*-value
				Much in need	Quite in need	Average	Not much in need	No need at all	
"To increase/upgrade digital resources"									
MS1	3.92	0.78	334	82 (25)	151 (45)	93 (28)	8 (2)	0 (0)	0.142
MS2	3.83	0.80	332	72 (22)	142 (43)	107 (32)	11 (3)	0 (0)	

Mean: 1= "No need at all" and 5="Much in need"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Lack of suitable digital resources was one of the major problems that schools encountered when implementing school ITEd plans as perceived by school heads

In MS1, school heads indicated that the lack of suitable educational software or digital resources (32%) was the second major problem that schools often or most often encountered when implementing school ITEd plans (Table 6.72, [P2]HQ3l). A statistically significant decrease was noted in school heads' perceived frequency of the difficulties encountered in implementing the ITEd plans in MS2 (from 32% to 26%). The major difficulty that ITEd Team teachers frequently or very frequently encountered in MS1 were insufficient IT facilities and digital resources from the EMB (34%). There was no statistically significant difference in this area for ITEd Team teachers in MS2 (Table 6.72, [P4]ITQ4k).

Table 6.72 School heads' and ITEd Team teachers' perceived frequency of difficulties encountered in implementing of ITEd plan ([P2]HQ3l, [P4]ITQ4k)

Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option					*P*-value
					Most often	Often	Occasionally (間中)	Rarely	Never	
"Lacking in suitable educational software/digital resources" (Mean: 1="Never" and 5="Most often")										
School heads	MS1	3.10	0.95	539	42 (8)	127 (24)	229 (42)	123 (23)	18 (3)	0.007**
	MS2	2.93	0.93	440	21 (5)	93 (21)	179 (41)	128 (29)	19 (4)	
		Mean (1-5)	**SD**	**N**	**Count (%) choosing the option**					***P*-value**
					Very Frequently	**Frequently**	**Occasionally (間中)**	**Rarely**	**Never**	
"There are insufficient IT facilities and digital resources from Education and Manpower Bureau" (Mean: 1="Never" and 5="Very frequently")										
ITEd team teachers	MS1	3.22	0.94	334	35 (10)	81 (24)	147 (44)	65 (19)	6 (2)	0.666
	MS2	3.19	1.01	332	40 (12)	79 (24)	127 (38)	77 (23)	9 (3)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.4.2 Digital Resources Repository

Schools have to keep a wide variety of high quality digital resources which should be well gathered and managed for easy sharing, retrieval and utilization. This section examines two digital resources repository platforms: school e-learning platforms and the HKEdCity, in terms of the learning effectiveness and satisfaction level of the services provided.

6.4.2.1 School e-Learning Platforms

e-Learning platform is a learning system developed within the environment of the Internet or intranet which provides various learning tools such as learning material download, assignment submission, online tests, learning records, etc.

Around one-third of the teachers and more than half of the students used e-learning platforms for teaching or learning — a statistically significant decrease was noted in the percentage of P6 students having used e-learning platforms for learning in MS2

With regard to the usage of e-learning platforms, around one-third of the primary school teachers (31%) and more than half of the students (54% of P4 and 55% of P6) respectively used the

platforms for learning and teaching in MS1 (Table 6.73, [P5]TQ11a, [P6]SQ12a). A statistically significant decrease was noted in the percentage of P6 students using the platforms for learning (from 55% to 49%) in MS2 and there was no statistically significant difference in those for P4 students and teachers in MS2. Of these, 73% of P4 and 80% of P6 respondents visited school e-learning platforms 1 to 10 times while 21% of P4 and 15% of P6 students respectively reported using the platforms 11 times or more during the week prior to the conduct of the questionnaire survey in MS1 (Table 6.75, [P6]SQ12b). 73% and 10% of the teachers used e-learning platforms to conduct teaching 1 to 10 times and 11 times or more respectively during the week prior to the conduct of the questionnaire survey in MS1 (Table 6.73, [P5]TQ11b). A statistically significant difference in the distribution of the frequency in using e-learning platforms for students and teachers was noted in MS2. A statistically significant decrease was noted in the frequency of P4 and P6 students using e-learning platforms (MS1: P4=9%-27% and P6=7%-32%; MS2: P4=8%-23% and P6=5%-22% used the platforms for 5 times or more) while an increase was observed in the frequency of teachers using e-learning platforms (from 17% to 24% used the platforms for 5 to 10 times) in MS2.

Table 6.73 The usage of e-learning platforms to conduct teaching / learning by teachers and students during the week prior to the conduct of the questionnaire survey ([P6]SQ12a,b [P5]TQ11a,b)

	Percentage (%) choosing the option											
	P4			*P*-value	P6			*P*-value	Teachers			*P*-value
	MS1 (N=1782)	MS2 (N=1934)			MS1 (N=1939)	MS2 (N=2030)			MS1 (N=1777)	MS2 (N=1743)		
Yes	54	51		0.103 [a]	55	49		0.000*** [a]	31	34		0.061 [a]
No	46	49			45	51			69	66		
Frequency	**(N=971)**	**(N=992)**	$\chi^2_{(df=4)}$	***P*-value**	**(N=1071)**	**(N=1004)**	$\chi^2_{(df=4)}$	***P*-value**	**(N=556)**	**(N=597)**	$\chi^2_{(df=4)}$	***P*-value**
16 times or above	12	8			8	5			4	3		
11 to 15 times	9	8			7	6			6	6		
5 to 10 times	27	23	20.27	0.001** [b]	32	22	61.03	0.000*** [b]	17	24	10.99	0.027* [b]
1 to 4 times	46	49			48	54			56	51		
Nil	7	12			6	13			17	17		

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.]Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived a higher level of agreement on the helpfulness of e-learning platforms to their learning than that of teachers

Regarding the learning effectiveness of e-learning platforms, as reported in MS1, around 60% of the students (66% of P4 and 58% of P6) agreed or strongly agreed that e-learning platforms could help their learning, with mean ratings of 3.86 (SD:0.86) and 3.65 (SD:0.84) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 6.74, [P6]SQ12d). Teachers perceived slightly a lower level of learning effectiveness of e-learning platforms than that of the students. Less than 40% of the primary school teachers (39%) agreed or strongly agreed that the use of e-learning platforms could help students in their learning, with a mean rating of 3.31 (SD:0.66) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'(Table 6.74, [P5]TQ11d). There was no statistically significant difference in teachers' and students' level of agreement on the helpfulness of e-learning platforms to students' learning in MS2.

Table 6.74 Teachers' and students' levels of agreement on the helpfulness of e-learning platforms to students' learning ([P5]TQ11d, [P6]SQ12d)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option					*P*-value
					Strongly agree	Agree	Average	Disagree	Strongly disagree	
P4	MS1	3.86	0.86	971	235 (24)	411 (42)	285 (29)	29 (3)	11 (1)	0.999
	MS2	3.85	0.89	992	240 (24)	432 (44)	264 (27)	40 (4)	16 (2)	
P6	MS1	3.65	0.84	1071	158 (15)	456 (43)	396 (37)	42 (4)	19 (2)	0.845
	MS2	3.62	0.81	1004	123 (12)	452 (45)	369 (37)	44 (4)	15 (1)	
Teachers	MS1	3.31	0.66	1778	16 (1)	676 (38)	962 (54)	93 (5)	31 (2)	0.749
	MS2	3.30	0.66	1757	18 (1)	645 (37)	964 (55)	102 (6)	28 (2)	

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students were satisfied with the services provided by school e-learning platforms

Students were asked to comment on the speed of downloading or uploading information and the degree of convenience in searching learning content (Table 6.75, [P6]SQ12e). In MS1, about half of the students (62% of P4 and 52% of P6) were satisfied or very satisfied with the services provided by school e-learning platforms, with mean ratings of 3.76 (SD:0.88) and 3.54 (SD:0.87) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. There was no statistically significant difference in students' levels of satisfaction with the services provided by the e-learning platforms in MS2.

Table 6.75 Students' levels of satisfaction with the services provided by school e-learning platforms ([P6]SQ12e)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the services provided by the e-learning platform															
P4	MS1	3.76	0.88	971	205	(21)	395	(41)	319	(33)	36	(4)	14	(1)	0.954
	MS2	3.74	0.93	992	212	(21)	412	(42)	298	(30)	43	(4)	28	(3)	
P6	MS1	3.54	0.87	1071	135	(13)	412	(39)	449	(42)	45	(4)	30	(3)	0.315
	MS2	3.56	0.85	1004	114	(11)	435	(43)	379	(38)	53	(5)	23	(2)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived a higher level of proficiency in using e-learning platforms than teachers — a statistically significant increase was noted in teachers' self-evaluated level of proficiency in using e-learning platforms in MS2

With respect to the proficiency of teachers and students in using e-learning platforms, it was notable in MS1 that only 22% of the teachers rated themselves as proficient or highly proficient and 33% rated not proficient or knew nothing about using these resources at all, with a mean rating of 2.80 (SD:0.94) on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient' (Table 6.76, [P5]TQ11c). Higher proficiency in this aspect was reported by students. At least 60% of the students (61% of P4 and 60% of P6) claimed that they were proficient or highly proficient in using them, with mean ratings of 3.69 (SD:1.05) and 3.68 (SD:0.94) respectively on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient' (Table 6.76, [P6]SQ12c). A statistically significant increase was noted in teachers' proficiency in using e-learning platforms (from 22% to 24%) in MS2. No statistically significant difference in P4 and P6 students' perceived level of proficiency in this area was found in MS2.

Table 6.76 Teachers' and students' self-evaluated proficiency in using e-learning platforms ([P5]TQ11c, [P6]SQ12c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		
Levels of proficiency in using e-learning platform															
P4	MS1	3.69	1.05	971	239	(25)	345	(36)	273	(28)	76	(8)	38	(4)	0.247
	MS2	3.64	1.03	992	222	(22)	354	(36)	286	(29)	98	(10)	31	(3)	
P6	MS1	3.68	0.94	1071	207	(19)	441	(41)	316	(29)	88	(8)	19	(2)	0.053
	MS2	3.61	0.85	1004	134	(13)	442	(44)	347	(35)	66	(7)	15	(2)	
Teachers	MS1	2.80	0.94	1773	29	(2)	358	(20)	805	(45)	385	(22)	196	(11)	0.003**
	MS2	2.89	0.90	1752	28	(2)	390	(22)	846	(48)	341	(19)	147	(8)	

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.4.2.2 Educational e-Portal: Hong Kong Education City (HKEdCity)

Hong Kong Education City (www.hkedcity.net) is strongly promoted by the EMB as one of the online digital resources repository to support learning and teaching. It serves to provide quality digital resources for teachers, students, schools and the community.

Over half of the students and 73% of the teachers visited the HKEdCity — a statistically significant increased usage by students was noted in MS2

With regard to the frequency of visiting the HKEdCity, over half of the students (53% of P4 and 56% of P6) in MS1 reported to have visited it. A statistically significant increase was noted in the percentages of students visiting the HKEdCity in MS2 (MS1: 53%-56%; MS2: 60%) (Table 6.77, [P6]SQ13a). In terms of the frequency of usage, of these, 70% of P4 and 72% of P6 respondents visited it 1 to 10 times a week while 18% of P4 and 10% of P6 respectively reported using it 11 times a week or more during the week prior to the conduct of the questionnaire survey. There was a statistically significant decrease in P6 students' frequency of usage (from 19% to 14% for 5 to 10 times) in MS2 (Table 6.77, [P6]SQ13b). The usage by teachers, on the other hand, was relatively higher than the students. 73% of the primary school teachers reported that they made use of it to assist their teaching (Table 6.77, [P5]TQ13a). Among them, 75% and 5% used it 1 to 10 times a week and 11 times or more a week respectively during the week prior to the conduct of the questionnaire survey (Table 6.77, [P5]TQ13b). There was no statistically significant difference in the percentage of teachers visiting the HKEdCity and in their frequency of usage in MS2.

Table 6.77 The usage of the HKEdCity by teachers and students during the week prior to the conduct of the questionnaire survey ([P5]TQ13a,b, [P6]SQ13a,b)

	Percentage (%) choosing the option											
	P4		*P*-value		P6		*P*-value		Teachers		*P*-value	
	MS1 (N=1781)	MS2 (N=1927)			MS1 (N=1943)	MS2 (N=2040)			MS1 (N=1828)	MS2 (N=1799)		
Yes	53	60	0.000*** [a]		56	60	0.001***[a]		73	73	0.947[a]	
No	47	40			44	40			27	27		
Frequency	**(N=951)**	**(N=1163)**	$\chi^2_{(df=4)}$	***P*-value**	**(N=1088)**	**(N=1230)**	$\chi^2_{(df=4)}$	***P*-value**	**(N=1340)**	**(N=1317)**	$\chi^2_{(df=4)}$	***P*-value**
16 times or above	8	8			5	4			1	2		
11 to 15 times	10	8			5	4			4	3		
5 to 10 times	20	22	4.046	0.397 [b]	19	14	15.48	0.004** [b]	18	21	8.39	0.078 [b]
1 to 4 times	50	49			53	55			57	55		
Nil	12	14			18	22			21	19		

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to be satisfied with the services provided at the HKEdCity

When examining their opinions about the services provided by the HKEdCity, around half of the students (59% of P4 and 50% of P6 students) in MS1 were satisfied or very satisfied with the speed of downloading or uploading information and the degree of convenience in searching learning content provided by this website, with mean ratings of 3.71 (SD:0.93) and 3.47 (SD:0.92) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 6.78, [P6]SQ13e). There was no statistically significant difference in students' level of satisfaction with the services provided at the HKEdCity in MS2.

Table 6.78 Students' levels of satisfaction with the services provided by the HKEdCity ([P6]SQ13e)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the services provided at the HKEdCity (Mean: 1="Totally not satisfied" and 5="Very satisfied")															
P4	MS1	3.71	0.93	948	200	(21)	360	(38)	319	(34)	48	(5)	21	(2)	0.437
	MS2	3.73	0.94	1163	244	(21)	480	(41)	351	(30)	57	(5)	32	(3)	
P6	MS1	3.47	0.92	1080	121	(11)	420	(39)	424	(39)	72	(7)	43	(4)	0.129
	MS2	3.54	0.85	1230	157	(13)	468	(38)	516	(42)	64	(5)	25	(2)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived that learning contents of the HKEdCity were occasionally updated

Less than half of the students (49% of P4 and 40% of P6) in MS1 considered that the learning contents of the HKEdCity were frequently or very frequently updated, with mean ratings of 3.53 (SD:1.03) and 3.30 (SD:0.94) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'(Table 6.79, [P6]SQ13f). There was no statistically significant difference in this area in MS2.

Table 6.79 Students' perceived frequency for updating the learning content at the HKEdCity ([P6]SQ13f)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never		
Frequency for updating the learning content at the HKEdCity (Mean: 1="Never" and 5="Very frequently")															
P4	MS1	3.53	1.03	945	191	(20)	274	(29)	357	(38)	87	(9)	36	(4)	0.248
	MS2	3.47	1.04	1163	212	(18)	345	(30)	428	(37)	131	(11)	47	(4)	
P6	MS1	3.30	0.94	1079	116	(11)	310	(29)	480	(45)	134	(12)	39	(4)	0.564
	MS2	3.28	0.93	1230	132	(11)	323	(26)	564	(46)	176	(14)	35	(3)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers and students tended to perceive that the learning materials provided by the HKEdCity were suitable for students

When asked about the suitability of learning materials provided by the HKEdCity, around half of the teachers (53%) in MS1 considered the learning materials provided by this website as suitable or very suitable for their students, with a mean rating of 3.51 (SD:0.60) on a scale of 1 to 5 where 1 was 'totally not suitable' and 5 was 'very suitable' ([P5]TQ13c). Similarly, about half of the students (58% of P4 and 47% of P6) found it suitable or very suitable for their learning, with mean ratings of 3.71 (SD:0.98) and 3.44 (SD:0.92) respectively (Table 6.80, [P6]SQ13c). There was no statistically significant difference regarding the suitability of learning materials provided by the HKEdCity for students in MS2.

Table 6.80 Teachers' and students' perceived levels of suitability of the learning materials provided by the HKEdCity for students ([P5]TQ13c, [P6]SQ13c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very suitable		Suitable		Quite suitable (一般)		Not suitable		Totally not suitable		
Levels of suitability of the learning materials provided by the HKEdCity for students (Mean: 1="Totally not suitable" and 5="Very suitable")															
P4	MS1	3.71	0.98	951	223	(23)	337	(35)	312	(33)	50	(5)	30	(3)	0.541
	MS2	3.74	0.95	1163	266	(23)	448	(39)	357	(31)	64	(5)	29	(3)	
P6	MS1	3.44	0.92	1088	128	(12)	379	(35)	460	(42)	82	(8)	38	(4)	0.455
	MS2	3.46	0.89	1230	139	(11)	452	(37)	511	(41)	96	(8)	33	(3)	
Teachers	MS1	3.51	0.60	1340	20	(1)	697	(52)	576	(43)	42	(3)	5	(0)	0.417
	MS2	3.54	0.61	1317	41	(3)	668	(51)	574	(44)	31	(2)	3	(0)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers, students and parents tended to perceive the HKEdCity to be effective in assisting students' learning

In terms of the learning effectiveness of the HKEdCity, 55% of the teachers, 59% of P4 and 49% of P6 students as well as 40% of the parents in MS1 considered the HKEdCity to be effective or very effective in assisting students' learning, with mean rating of 3.54 (SD:0.59), 3.69 (SD:0.94),3.46 (SD:0.92) and 3.39 (SD:0.66) respectively on a scale of 1 to 5 where 1 was 'totally not effective' and 5 was 'very effective' (Table 6.81, [P5]TQ13d, [P6]SQ13d, [P7]PQ10c). There was no statistically significant difference in teachers', students' and parents' perceived level of effectiveness of the HKEdCity in assisting students' learning in MS2.

Table 6.81 Teachers', students' and parents' perception of the effectiveness of the HKEdCity in assisting students' learning ([P5]TQ13d, [P6]SQ13d, [P7]PQ10c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very effective		Effective		Quite effective (一般)		Not effective		Totally not effective		
Levels of effectiveness of the HKEdCity in assisting students' learning (Mean: 1="Totally not effective" and 5="Very effective")															
P4	MS1	3.69	0.94	951	193	(20)	367	(39)	318	(33)	51	(5)	23	(2)	0.483
	MS2	3.71	0.96	1163	254	(22)	450	(39)	367	(32)	56	(5)	35	(3)	
P6	MS1	3.46	0.92	1088	126	(12)	399	(37)	451	(41)	68	(6)	44	(4)	0.658
	MS2	3.48	0.89	1230	144	(12)	455	(37)	514	(42)	82	(7)	34	(3)	
Parents	MS1	3.39	0.66	1602	53	(3)	592	(37)	880	(55)	66	(4)	10	(1)	0.561
	MS2	3.41	0.62	1801	51	(3)	702	(39)	981	(54)	64	(4)	3	(0)	
Teachers	MS1	3.54	0.59	1340	26	(2)	708	(53)	568	(42)	34	(3)	4	(0)	0.283
	MS2	3.57	0.59	1317	41	(3)	694	(53)	559	(42)	22	(2)	1	(0)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

The fifth strategic goal of the Second ITEd Strategy is "Improving IT infrastructure and pioneering pedagogy using IT". The progress of IT infrastructure improvement is tracked in terms of the sufficiency of serviceable IT facilities and technical support for students and teachers, especially with the new technology to support innovative pedagogy to enhance learning and teaching.

The following sections examine the extent of IT infrastructure development in surveyed primary schools in three aspects:

- Access and connectivity in schools
- Management and maintenance of IT facilities and technical support services
- Upgrading IT facilities and exploring advanced IT technology

6.5.1 Access and Connectivity in Schools

School heads were satisfied that their schools provided sound and sufficient IT facilities for students and teachers

Schools should be able to provide students and teachers with good serviceable computers and other IT facilities, well-maintained school network for communication and access to multimedia-rich content inside school as well as sufficient bandwidth for the connection to the Internet at all times. 72% of school heads were satisfied or very satisfied that their schools provided sound and sufficient IT facilities for students and teachers in MS1. A statistically significant increase was identified in school heads' level of satisfaction (from 72% to 78%) in MS2 (Table 6.82, [P1]HSQ6d).

Table 6.82 School heads' levels of satisfaction with the provision of IT infrastructure ([P1]HSQ6d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school provides sound and sufficient IT facilities for students and teachers."									
MS1	3.83	0.73	551	84 (15)	312 (57)	134 (24)	19 (3)	2 (0)	0.028*
MS2	3.93	0.70	445	79 (18)	269 (60)	84 (19)	12 (3)	1 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.5.1.1 Quantities and Locations of Hardware

Hardware was greatly improved in primary schools — the numbers of computers and digital projectors in classrooms significantly increased statistically and the teacher-computer ratio was improved to 2.87:1 in MS2

With extensive input and support from the EMB under the Five-year Strategy, fundamental IT infrastructure has been well set up in schools. Table 6.83 ([P3]ITEdInfoQ3a.i-ii) lists out the average numbers of different types of IT facilities in primary schools. In MS1, the numbers of desktop and notebook computers per school were 105.37 and 12.11 respectively. The average number of video broadcasting systems was 0.40. 56% of the schools reported having at least 1 wireless Local Area Network (LAN) in schools (Table 6.83, [P3]ITEdInfoQ3aii_1). The numbers of digital projectors for mobile use and that for fixed installation were 2.25 and 19.80 respectively. Regarding the provision of electronic whiteboards, there were an average of 0.16 for mobile use and 0.27 for fixed installation per primary school (Table 6.83, [P3]ITEdInfoQ3a,4). In MS2, the numbers of desktop computers (from 105.37 to 115.23) and video broadcasting systems (from 0.40 to 0.54) per school significantly increased statistically. A statistically significant increase was noted in the percentage of schools having at least 1 wireless LAN in schools (from 56% to 73%).

A statistically significant increase from 19.80 in MS1 to 23.63 in MS2 was also identified in the average number of digital projectors for fixed installation.

As mentioned in the Overall Study, the IT facilities in different locations, especially in classrooms, provided the convenience of IT integration for learning and teaching. This survey has enquired about the locations of IT facilities, including computers, digital projectors and electronic whiteboards. As seen from Table 6.83 ([P3]ITEdInfoQ4a-g), an average of 17.74 computers (including desktop and notebook) per primary school allocated to an average of 20.40 general classrooms was found in MS1 while there was a statistically significant increase to an average of 20.01 computers (including desktop and notebook) per primary school which were allocated to an average of 21.50 general classrooms in MS2. Schools reported an average of 58.07 computers in computer rooms [including Multimedia Learning Centre (MMLC) or IT Learning Centre (ITLC) and Computer Laboratory (CL)] per school in MS1. There was a statistically significant increase (from 14.68 to 17.46) in MS2 in the average number of digital projectors (including LCD projectors) installed in general classrooms in MS2.

Table 6.83 Quantity of IT facilities and services in school ([P3]ITEdInfoQ3a.i-ii, 4a-g)

IT facilities	MS1		MS2		*P*-value
	Mean	SD	Mean	SD	
i. Computers:					
Desktop Computer	105.37	47.7	115.23	47.53	0.001**
Notebook	12.11	14.73	12.68	13.81	0.329
Sum of Computers (including desktop and notebook)	117.70	51.41	127.91	51.01	0.001**
Computers (including desktop and notebook) located in general classrooms	17.74	12.88	20.01	13.36	0.005**
Number of general classrooms	20.40	9.43	21.50	8.57	0.052
Computers (including desktop and notebook) located in computer rooms [including Multimedia Learning Center (MMLC), IT Learning Center (ITLC) and Computer Laboratory (CL)]	58.07	32.4	59.35	30.89	0.315
Number of Computer rooms [including Multimedia Learning Center (MMLC), IT Learning Center (ITLC) and Computer Laboratory (CL)]	2.45	6.27	1.88	1.63	0.492
Student to computer gross ratio	5.95:1	6.96	5.70:1	5.21	0.278
Student to computer net ratio (excluding computers in the staff rooms and general office)	6.77:1	7:14	6.53:1	8.69	0.011*
Teacher to computer ratio (computers in staff room)	5.90:1	5:43	2.87:1	2.66	0.000***
ii. System/Peripheral facilities:					
Wireless LAN	1.85	3.53	3.32	6.2	0.001**
Percentage with at least 1 Wireless LAN	56%		73%		
Video Broadcasting System	0.4	0.75	0.54	1.6	0.033*
Electronic Whiteboard for mobile use	0.16	0.56	0.18	1.16	0.394
Sum of Electronic Whiteboard located in different rooms	0.27		0.53		0.035*
Digital Projectors (including LCD Projector) for mobile use	2.25	2.07	2.12	1.98	0.369
Digital Projectors located in general classrooms	14.68	11.18	17.46	10.73	0.000***
Sum of Digital Projectors (including LCD Projector) located in different rooms	19.8		23.63		0.000***
Sum of rooms	31.48		32.56		0.038*

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

On average, there was 117.70 (SD: 51.41) computers per school in total (including desktop and notebook) for students and teachers in MS1. A statistically significant difference was observed in the total number of computers in primary schools (from 117.70 to 127.91) in MS2 (Table 6.83, [P3]ITEdInfoQ3a.i_1,2). Table 6.84 ([P3]ITEdInfoQ3a.i_1,2) shows the distribution of schools with respect to total number of computers. Nearly three-quarters of schools (77%) had 80 computers or more and 23% of schools reported having less than 80 computers including 4% of schools having less than 40 computers in MS1. An increase to 84% of schools reported having 80 computers or more was noted in MS2 (Table 6.84, [P3]ITEdInfoQ3a.i_1,2)

Table 6.84 Distribution of primary schools with respect to total number of computers ([P3]ITEdInfoQ3a.i_1,2)

Total number of computers in school	Percentage (%)	
	MS1 (N=541) #	MS2 (N=434) #
>= 160	16	21
120 - <160	29	34
80 - <120	32	29
40 - <80	19	14
<40	4	2
Total	100	100

Number of schools refers to valid cases related to corresponding computing.

The student-computer ratio and teacher-computer ratio are the indicators to evaluate the adequacy of computers for the specific user groups: teachers and students. The student-to-computer net ratios (excluding computers in staff rooms and general office) for MS1 and MS2 were 6.77:1 (SD:7.14) and 6.53:1 (SD:8.69) respectively. A statistically significant difference was noted in MS2 (Table 6.83). When taking into account of all computers in school, including those in staff rooms, offices, etc, the student-to-computer gross ratio for MS1 was 5.95:1 (SD:6.96). No statistically significant difference was noted in MS2 (Table 6.83). Table 6.85 ([P3]ITEdInfoQ1b, 3a.i_1,2,4e_2,f_2) shows the distribution of student-to-computer ratio across primary schools. About half of the primary schools, the student-to-computer net ratio fell within the range of four to less than eight students to one in both MS1 and MS2. 19% of the schools had net ratio of less than four students (<4) to one and only 6% had 12 or more students (>=12) to one in MS1 while 26% of the schools had net ratio of less than four teachers (<4) to one and only 4% had 12 or more students (>=12) to one in MS2.

Table 6.85 Distribution of the primary schools with respect to student-computer ratios ([P3]ITEdInfoQ1b,3a.i_1,2, 4e_2,f_2)

Student-computer ratio	Percentage (%)			
	Gross		Net	
	MS1 (N=540) #	MS2 (N=434) #	MS1 (N=538) #	MS2 (N=433) #
>= 20	0	0	1	1
16 - <20	1	1	1	1
12 - <16	2	2	4	2
8 - <12	17	13	26	16
4 - <8	57	54	50	55
<4	22	30	19	26
Total	100	100	100	100

Number of schools refers to valid cases related to corresponding computing. .

A statistically significant difference was noted in the average teacher-to-computer (computers in staff rooms) ratio from 5.90:1 (SD:5.43) in MS1 to 2.87:1 (SD:2.66) in MS2 (Table 6.83). Table 6.86 ([P3]ITEdInfoQ1c,4e_2) shows the distribution of teacher-to-computer ratio across primary schools. In MS1, about half of schools (45%) had a teacher-to-computer ratio that fell within the range of four to less than eight teachers (4-<8) to one. 33% of schools had a ratio of less than four (<4) to one and only 3% had a ratio of 20 or more teachers (>=20) per computer in staff rooms. In MS2, 12% of schools had teacher-to-computer ratio that fell within the range of four to less than eight teachers (4-<8) to one.

Table 6.86 Distribution of schools with respect to teacher-computer ratios ([P3]ITEdInfoQ1c,4e_2)

Teacher-computer ratio	Percentage (%)	
	MS1 (N=505) #	MS2 (N=412) #
>= 20	3	0
16 - <20	2	1
12 - <16	3	0
8 - <12	15	3
4 - <8	45	12
<4	33	84
Total	100	100

Number of schools refers to valid cases related to corresponding computing.
46 (9%) and 103 (25%) primary schools had 1:1 teacher-computer ratio in MS1 and MS2 respectively. 38 (7%) and 22 (5%) schools had no computers in staff rooms in MS1 and MS2 respectively.

Students perceived a higher level of sufficiency than teachers on school IT facilities to meet their needs

The adequacy of IT facilities in schools is further examined from users' perspective. It was found that the proportion of students expressing that school IT facilities were sufficient to meet their learning needs was much higher than that of teachers in MS1. 63% of P4 and 53% of P6 students considered that the IT facilities in schools were sufficient or very sufficient to meet their learning needs, with mean ratings of 3.76 (SD:1.02) and 3.48 (SD:1.02) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.87, [P6]SQ7a). In MS2, no statistically significant difference was found in P4 students, but a statistically significant increase was identified in P6 students (from 53% to 60%).

Teachers were also asked to corroborate their views on the adequacy of school IT facilities to meet students' needs in MS1. 40% of the teachers reported the IT facilities in schools as sufficient or very sufficient to meet students' needs, with a mean rating of 3.19 (SD:0.91) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.87, [P5]TQ7a). In MS2, a statistically significant increase in teachers' perceived level of sufficiency in this aspect was identified (from 40% to 49%).

Teachers perceived the IT facilities in schools as quite sufficient (一般) to meet their teaching needs

With respect to teachers' needs, 37% of the primary school teachers perceived the IT facilities in schools as sufficient or very sufficient to meet their needs whereas about one fourth (26%) of them considered that they were insufficient or totally insufficient to meet their needs in MS1. The mean rating of the item was 3.08 (SD:0.95) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.87, [P5]TQ7b). A statistically significant increase was noted in teachers' perceived level of sufficiency (from 37% to 47%) in MS2.

Table 6.87 Teachers' and students' perception of the sufficiency of IT facilities in schools to meet students' and teachers' needs ([P5]TQ7a,b, [P6]SQ7a)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
Levels of sufficiency of the IT facilities in schools to meet students' need															
P4	MS1	3.76	1.02	1783	465	(26)	662	(37)	483	(27)	107	(6)	66	(4)	0.092
	MS2	3.83	1.00	1958	537	(27)	790	(40)	465	(24)	95	(5)	72	(4)	
P6	MS1	3.48	1.02	1945	278	(14)	751	(39)	654	(34)	150	(8)	112	(6)	0.000***
	MS2	3.63	0.98	2056	364	(18)	857	(42)	617	(30)	139	(7)	79	(4)	
Teachers	MS1	3.19	0.91	1830	63	(3)	686	(37)	711	(39)	275	(15)	95	(5)	0.000***
	MS2	3.38	0.88	1803	122	(7)	752	(42)	658	(36)	223	(12)	48	(3)	
Levels of sufficiency of the IT facilities in schools meet teachers' need															
Teachers	MS1	3.08	0.95	1830	56	(3)	624	(34)	669	(37)	371	(20)	110	(6)	0.000***
	MS2	3.29	0.97	1803	136	(8)	702	(39)	588	(33)	304	(17)	73	(4)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.5.1.2 Connectivity and Internet/Intranet Services

All schools in MS1 had broadband Internet connection — a statistically significant increase was noted in the percentage of schools having a connection speed of 10Mbps or higher in MS2

Connectivity to the Internet is another aspect that has prominent effect on learning and teaching with IT. All primary schools reported having broadband Internet connection in MS1 and MS2. As for the connection speed, a statistically significant increase was identified in the percentage of schools having a connection speed of 10Mbps or higher (from 62% to 64%) in MS2. (Table 6.88, [P3]ITEdInfoQ5a,b).

73% and 61% of schools in MS1 respectively provided intranets and e-learning platforms — a statistically significant increase was noted in MS2

With regard to the Internet service provided by schools, Table 6.88 ([P3]ITEdInfoQ6a-c) shows the percentages of schools with school homepages, teachers' or students' homepages, e-learning platforms and intranets. In MS1, nearly all schools (98%) had school websites. 73% of schools had school intranets. 61% of them had e-learning platforms. About one fourth of schools had teachers' homepages (24%) and even less had students' homepages (15%). A statistically significant increase was noted in the percentages of schools with school intranets (from 73% to 82%) and e-learning platforms (from 61% to 76%) in MS2.

Table 6.88 Percentage of schools with Internet connection, school homepages /teachers' homepages/students' homepages/e-learning platforms and intranet ([P3]ITEdInfoQ5a,b,6a)

IT facilities	MS1 (N=549)	MS2 (N=434)	*P*-value
i. Internet Connection			
Broadband	100	100	1.000
Speed of connection: 10Mbps or higher	62	64	0.019*
ii. Intranet/internet Services			
School homepage	98	98	0.803
E-learning platform	61	76	0.000 ***
School Intranet	73	82	0.001**
Teachers' homepage	24	22	0.415
Students' homepage	15	15	0.827

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

P4 students and teachers tended to be satisfied with the speed of Internet connection in schools while P6 students were quite satisfied (一般) with it in MS1 – a statistically significant increase was noted in teachers' and students' perceived level of satisfaction in this aspect in MS2

The speed of Internet connection in schools is further examined from the users' perspective. In MS1, 54% of P4 and 40% of P6 students were satisfied or very satisfied with the speed of Internet connection in schools, with mean ratings of 3.53 (SD:1.06) and 3.16 (SD:1.14) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 6.89, [P6]SQ7c). P6 students were less satisfied with the Internet connection in schools than that of P4 students. As for the teachers, slightly over half of them (51%) were satisfied or very satisfied with the speed of Internet connection in schools, with a mean rating of 3.41 (SD:0.83) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 6.89, [P5]TQ7e). There was a statistically significant increase in teachers' (from 51% to 54%) and students' (MS1: 40%-54%; MS2: 46%-60%) perceived level of satisfaction with the speed of Internet connection in schools in MS2.

Table 6.89 Teachers' and students' perception of the levels of satisfaction with the speed of Internet connection in schools ([P5]TQ7e, [P6]SQ7c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option					*P*-value
					Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
P4	MS1	3.53	1.06	1777	335 (19)	621 (35)	581 (33)	143 (8)	98 (6)	0.002**
	MS2	3.62	1.10	1954	440 (23)	730 (37)	510 (26)	157 (8)	116 (6)	
P6	MS1	3.16	1.14	1945	235 (12)	539 (28)	678 (35)	286 (15)	208 (11)	0.000***
	MS2	3.31	1.12	2058	296 (14)	649 (32)	681 (33)	255 (12)	176 (9)	
Teachers	MS1	3.41	0.83	1830	92 (5)	836 (46)	668 (37)	195 (11)	39 (2)	0.006**
	MS2	3.49	0.83	1802	137 (8)	831 (46)	643 (36)	156 (9)	35 (2)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.5.1.3 Computer Consumables

Teachers and students tended to perceive the consumables in schools as sufficient — P6 students' and teachers' perceived sufficiency level of consumables in schools significantly increased statistically in MS2

Schools should provide sufficient consumables such as paper and toner for printers to support learning and teaching. In MS1, about half of the primary school students (52% of P4 and 42% of P6) expressed that consumables were sufficient or very sufficient, while around one-fifth of them (15% of P4 and 23% of P6) considered consumables in schools as insufficient or totally insufficient. The mean ratings of this item were 3.48 (SD:1.06) and 3.21 (SD:1.08) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.90, [P6]SQ7d). Teachers shared similar views on this issue. Half of the teachers (50%) considered computer consumables as sufficient or very sufficient while 21% regarded them as insufficient or totally insufficient, with a mean rating of 3.30 (SD:0.96) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.90, [P5]TQ7f). A statistically significant increase was observed in teachers' (from 50% to 56%) and P6 students' (from 42% to 46%) perceived sufficiency level of consumables in schools in MS2.

Table 6.90 Teachers' and students' perception of the sufficiency of consumables (e.g. paper and toner for printers) in schools ([P5]TQ7f, [P6]SQ7d)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
P4	MS1	3.48	1.06	1779	314	(18)	603	(34)	582	(33)	186	(10)	95	(5)	0.431
	MS2	3.50	1.09	1949	360	(18)	664	(34)	638	(33)	158	(8)	129	(7)	
P6	MS1	3.21	1.08	1946	206	(11)	602	(31)	700	(36)	271	(14)	167	(9)	0.000***
	MS2	3.35	1.07	2057	276	(13)	687	(33)	714	(35)	231	(11)	149	(7)	
Teachers	MS1	3.30	0.96	1830	102	(6)	802	(44)	548	(30)	293	(16)	85	(5)	0.000***
	MS2	3.47	0.88	1802	137	(8)	859	(48)	562	(31)	198	(11)	46	(3)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.5.1.4 Provision of Computer Facilities beyond School Hours

School heads were satisfied with the provision of sufficient IT facilities for students beyond school hours

The provision of computer facilities beyond school hours is also important to support students' learning with the use of IT. As reported in Section 6.7.3, nearly all primary schools (94%) had opened computer rooms for students after school in MS1 (Table 6.127, [P2]HQ10a). 73% of school heads were satisfied or very satisfied with the provision of sufficient IT facilities for students beyond school hours. No statistically significant difference was found in MS2 (Table 6.91, [P1]HSQ6g).

Table 6.91 School heads' levels of satisfaction with the provision of sufficient IT facilities for students beyond school hours ([P1]HSQ6g)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option										*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"The school provides sufficient IT facilities for students beyond school hours."														
MS1	3.90	0.79	551	117	(21)	288	(52)	121	(22)	23	(4)	2	(0)	0.542
MS2	3.94	0.70	445	84	(19)	262	(59)	89	(20)	9	(2)	1	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students considered the opening hours of computer rooms beyond school hours as quite sufficient (一般)

When students were asked about the sufficiency of opening hours of computer facilities after school, 43% of P4 and 32% of P6 students considered the opening hours to be sufficient or very sufficient, while 26% of P4 and 38% of P6 students considered it as insufficient or totally insufficient in MS1. The mean ratings of this item were 3.22 (SD:1.19) and 2.85 (SD:1.19) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.92, [P6]SQ7e). This indicates that the need of computer facilities after school for P6 students is higher than that of P4 students. A statistically significant increase was noted in P6 students' (from 32% to 35%) perceived level of sufficiency in this aspect in MS2.

Table 6.92 Students' perception of the levels of sufficiency with regards to the opening hours of computer rooms beyond school hours ([P6]SQ7e)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
P4	MS1	3.22	1.19	1651	256	(15)	458	(28)	510	(31)	253	(15)	175	(11)	0.957
	MS2	3.24	1.22	1799	304	(17)	487	(27)	545	(30)	259	(14)	204	(11)	
P6	MS1	2.85	1.19	1761	150	(9)	398	(23)	538	(31)	389	(22)	285	(16)	0.000***
	MS2	3.05	1.13	1857	186	(10)	472	(25)	644	(35)	357	(19)	198	(11)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.5.2 Management and Maintenance of IT Facilities and Technical Support Services

School heads were satisfied with the quality IT management, maintenance and technical support services provided by their schools for students and teachers

While a well-established infrastructure and sufficient IT facilities in schools are important to the successful implementation of ITEd, other factors such as effective management and maintenance of IT facilities and efficient technical support services are also crucial. In MS1, most of school heads (84%) were satisfied or very satisfied with the quality IT management, maintenance and technical support services provided by their schools for students and teachers. No statistically significant difference was found in MS2 (Table 6.93, [P1]HSQ6e).

Table 6.93 School heads' levels of satisfaction with IT management, maintenance and technical support services ([P1]HSQ6e)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option										*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"The school provides quality IT management, maintenance and technical support services for students and teachers"														
MS1	4.03	0.63	551	113	(21)	347	(63)	86	(16)	5	(1)	0	(0)	0.546
MS2	4.05	0.61	445	89	(20)	296	(67)	54	(12)	6	(1)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to perceive that it was easy to get support when encountering technical problems in using computers

When looking into the easiness of getting technical support (Table 6.94, [P6]SQ9a), about 40% of the students (41% of P4 and 42% of P6) in MS1 considered that it was easy or very easy to get such support when they encountered technical problems, with mean ratings of 3.32 (SD:1.18) and 3.33 (SD:1.09) respectively on a scale of 1 to 5 where 1 was 'not easy at all' and 5 was 'very easy'. A statistically significant increase was observed in P6 students' perceived level of easiness in getting such support (from 42% to 46%) in MS2.

Table 6.94 Students' perception of the levels of easiness in getting support when encountering technical problems in using the computers ([P6]SQ9a)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option					P-value
					Very easy	Easy	Quite easy (一般)	Not easy	Not easy at all	
P4	MS1	3.32	1.18	1777	363 (20)	380 (21)	649 (36)	238 (13)	148 (8)	0.943
	MS2	3.33	1.17	1953	395 (20)	420 (22)	737 (38)	242 (12)	158 (8)	
P6	MS1	3.33	1.09	1947	324 (17)	487 (25)	762 (39)	247 (13)	127 (6)	0.001**
	MS2	3.44	1.07	2047	387 (19)	556 (27)	770 (38)	236 (12)	98 (5)	

Mean: 1="Not easy at all" and 5="Very easy"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers considered the technical support provided by IT technicians in schools as the most satisfactory channel

With regard to the channels from which the teachers could seek technical support, it was found in MS1 that 30% to 40% of the teachers indicated that they did not seek technical support from the "EMB" (40%), the "HKEdCity" (34%), "school-based technical support service provider" (31%) as well as "friends and relatives" (30%). 72% of the respondents considered the support from "IT technicians in school" as satisfied or very satisfied, followed by "ITEd Team members" (66%), "other colleagues in school" (60%) as well as "friends and relatives" (53%). Less than 45% of them were satisfied or very satisfied with the technical support from the "HKEdCity" (44%) and "school-based technical support service provider" (37%). Other support channels from the EMB such as Centres of Excellence (CoEs) and ITEd Support Service Centre (ITeHelp) were considered as satisfied or very satisfied by 23% of the surveyed teachers, with a mean rating of 3.10 (SD:0.67) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. A statistically significant increase was observed in teachers' perceived level of satisfaction with the technical support received from school-based technical support service provider (from 37% to 42%) and from other technical support service provider (from 30% to 37%) in MS2 (Table 6.95, [P5]TQ9b.i-ix).

Table 6.95 Teachers' levels of satisfaction with the technical support from different channels when encountering technical problems in using the computers ([P5]TQ9b.i-ix)

Channels of technical support	MS1																MS2												*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option												No related technical support channels (不曾要求有關支援)	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option										No related technical support channels (不曾要求有關支援)	
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied								Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied			
i. ITEd team members in school	3.71	0.71	1767	176	(10)	984	(56)	548	(31)	42	(2)	17	(1)	63 (3)		3.72	0.73	1758	190	(11)	968	(55)	534	(30)	48	(3)	18	(1)	44 (2)	0.678
ii. IT technician(s) in school	3.79	0.70	1806	210	(12)	1078	(60)	467	(26)	34	(2)	17	(1)	24 (1)		3.79	0.73	1780	236	(13)	999	(56)	489	(27)	40	(2)	16	(1)	22 (1)	0.784
iii. Other Colleagues in school	3.64	0.65	1753	115	(7)	930	(53)	674	(38)	26	(1)	8	(0)	77 (4)		3.68	0.66	1739	139	(8)	940	(54)	623	(36)	32	(2)	5	(0)	63 (3)	0.073
iv. School-based technical support service provider	3.32	0.66	1260	30	(2)	444	(35)	702	(56)	71	(6)	13	(1)	570 (31)		3.39	0.69	1304	52	(4)	501	(38)	664	(51)	79	(6)	8	(1)	498 (28)	0.012*
v. Other technical support service provider	3.23	0.64	1134	18	(2)	323	(28)	705	(62)	74	(7)	14	(1)	696 (38)		3.33	0.67	1194	39	(3)	406	(34)	669	(56)	72	(6)	8	(1)	608 (34)	0.000***
vi. Education and Manpower Bureau [e.g. Centres of Excellence(CoEs) , ITEd Support Service Center (ITeHelp)*]	3.10	0.67	988	10	(1)	215	(22)	649	(66)	88	(9)	26	(3)	649 (40)		3.15	0.71	1063	30	(3)	245	(23)	675	(63)	84	(8)	29	(3)	739 (41)	0.067
vii. HKEdCity	3.41	0.68	1175	38	(3)	480	(41)	595	(51)	48	(4)	14	(1)	595 (34)		3.40	0.69	1191	51	(4)	447	(38)	630	(53)	50	(4)	13	(1)	611 (34)	0.496
viii. Friends and relatives	3.59	0.73	1520	143	(9)	675	(44)	648	(43)	40	(3)	14	(1)	648 (30)		3.64	0.73	1535	166	(11)	703	(46)	613	(40)	46	(3)	7	(0)	267 (15)	0.077
ix. Others (Please specify)	3.23	0.61	22	1	(5)	4	(18)	16	(73)	1	(5)	0	(0)	27 (55)		3.45	0.87	56	6	(11)	19	(34)	27	(48)	2	(4)	2	(4)	64 (4)	0.144

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.
N=Valid count (N) (excluding no. of teachers choosing 'No related technical support channels')
*Information Technology in Education Support Centre Service

6.5.3 Upgrading IT Facilities and Exploring Advanced IT Technology

School heads were satisfied that their schools continually upgraded IT facilities and explored advanced IT technology for learning and teaching

Upgrading IT facilities and exploring advanced information technologies for enhancing learning and teaching are other key aspects for successful implementation of ITEd. In MS1, 84% of school heads were satisfied or very satisfied that their schools continually improved the IT infrastructure and renewed equipment to effectively support the present day learning and teaching needs. 73% of school heads were satisfied or very satisfied that their schools continually improved IT infrastructure with advanced technology to enhance the effectiveness in learning, teaching, assessment and school administration. A statistically significant increase was observed in school heads' level of satisfaction (from 73% to 80%) with their school continually improving IT infrastructure with advanced technology to enhance the effectiveness in learning, teaching, assessment and school administration in MS2 (Table 6.96, [P1]HSQ6h,i).

Table 6.96 School heads' levels of satisfaction with the improvement of IT infrastructure ([P1]HSQ6h,i)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school continually improves the IT infrastructure and renews equipment to effectively support the present day learning and teaching needs."									
MS1	4.04	0.67	551	122 (22)	344 (62)	73 (13)	11 (2)	1 (0)	0.291
MS2	4.09	0.62	445	98 (22)	298 (67)	41 (9)	7 (2)	1 (0)	
"The school continually improves IT infrastructure with advanced technology to enhance the effectiveness in learning, teaching, assessment and school administration."									
MS1	3.83	0.68	551	76 (14)	323 (59)	137 (25)	15 (3)	0 (0)	0.034*
MS2	3.92	0.63	445	62 (14)	294 (66)	82 (18)	6 (1)	1 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students and teachers tended to perceive that the IT infrastructure was sufficient to meet their needs — a statistically significant increase was noted in students' and teachers' perceived level of sufficiency of IT infrastructure in MS2

In MS1, around two-fifths of the teachers (43%) considered the IT infrastructure such as upgraded computer model and computer operating system in their schools as sufficient or very sufficient to meet their teaching needs whereas 17% considered them as insufficient or totally insufficient. The mean rating of the item was 3.25 (SD:0.87) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.97, [P5]TQ7c). A statistically significant increase was noted in teachers' (from 43% to 48%) perceived level of sufficiency of IT infrastructure to meet their teaching needs in MS2.

As for the students, 59% of P4 and 51% of P6 students in MS1 considered the IT infrastructure in schools as sufficient or very sufficient in meeting their learning needs, with mean ratings of 3.69 (SD:0.99) and 3.47 (SD:1.02) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.97, [P6]SQ7b). A statistically significant increase was noted in students' perceived level of sufficiency of IT infrastructure to meet their learning needs (MS1: 51%-59%; MS2: 59%-66%) in MS2.

Teachers tended to perceive the advanced IT facilities as sufficient to promote innovative teaching pedagogy

When teachers were asked about the sufficiency of advanced IT facilities such as wireless network system in promoting innovative teaching pedagogy, less than half of the respondents in MS1 (43%) considered them as sufficient or very sufficient and 16% considered them as insufficient or totally insufficient, with a mean rating of 3.25 (SD:0.84) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.97, [P5]TQ7d). A statistically significant increase was noted in teachers' (from 43% to 47%) perceived sufficiency level of the IT facilities in schools to promote innovative teaching pedagogy in MS2.

Table 6.97 Teachers' and students' perception of the sufficiency of IT infrastructure meet their needs and the IT facilities in schools to promote innovative teaching pedagogy ([P5]TQ7c,d, [P6]SQ7b)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
Levels of sufficiency of IT infrastructure (e.g. upgraded computer model and computer operating system) meet students' learning/teachers' teaching needs															
P4	MS1	3.69	0.99	1779	403	(23)	648	(36)	559	(31)	110	(6)	59	(3)	0.001**
	MS2	3.81	0.96	1958	500	(26)	785	(40)	522	(27)	99	(5)	52	(3)	
P6	MS1	3.47	1.02	1942	289	(15)	707	(36)	665	(34)	179	(9)	101	(5)	0.000***
	MS2	3.63	0.96	2058	354	(17)	867	(42)	629	(31)	133	(6)	74	(4)	
Teachers	MS1	3.25	0.87	1830	57	(3)	735	(40)	722	(39)	246	(13)	70	(4)	0.000***
	MS2	3.37	0.85	1802	97	(5)	770	(43)	684	(38)	207	(11)	44	(2)	
Levels of sufficiency of IT facilities (e.g. wireless network system) in schools to promote innovative teaching pedagogy															
Teachers	MS1	3.25	0.84	1830	49	(3)	727	(40)	753	(41)	241	(13)	60	(3)	0.000***
	MS2	3.39	0.79	1802	87	(5)	762	(42)	742	(41)	188	(10)	23	(1)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in primary schools as indicated by school heads were: computers and projectors in classrooms, multi-media computer rooms and e-learning platforms

School heads were also asked to indicate the three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in schools. The three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in schools as reported by school heads were: "computers and projectors in classroom" (58%), "multi-media computer rooms" (53%) and "e-learning platform" (53%). They were followed by "wireless network" (35%), "school campus digital TV" (31%) and 'mobile learning devices' (29%). The two least needed IT facilities or services were "video conferencing devices" (5%) and "e-mail" (2%) (Table 6.98, [P2]HQ7). There was a statistically significant increase in the need of "interactive electronic whiteboard" (from 10% to 25%) and "digital tools" (from 11% to 20%) in MS2 and a statistically significant decrease in the need of "wireless network" (from 35% to 25%) and "e-learning platform" (from 53% to 45%) in MS2.

The three most needed additional IT facilities or services which should be prioritized for teachers' and students' use as indicated by school heads were: e-learning platforms, computers and projectors in classrooms as well as mobile learning devices in MS1 — the need of interactive electronic whiteboards significantly increased statistically while the need of e-learning platforms significantly decreased statistically in MS2

The school heads indicated the top three priorities for additional IT facilities or services that most needed for students and teachers (Table 6.98, [P2]HQ8). It was found in MS1 that "e-learning platform" (47%), "computers and projectors in classroom" (46%) and "mobile learning devices" (41%) and "multi-media computer rooms" (40%) were the top four on the list. The result was consistent with the priorities indicated by school heads on the most needed IT facilities or services to be upgraded. Despite the fact that 46% of schools were still concerned about conventional technologies such as "computers and projectors in classroom", quite a number of them indicated the needs for more advanced technologies such as "mobile learning devices" (41%) and "wireless network" (35%). A statistically significant increase was noted in the percentage of school heads choosing the priority of "interactive electronic whiteboard" (from 24% to 40%), "mobile learning devices" (from 41% to 49%) and "digital tools" (from 11% to 17%) for additional IT facilities or services which were needed for students and teachers and a statistically significant decrease in the priority of "e-learning platform" (from 47% to 36%), "multi-media computer rooms" (from 40% to 30%) and "wireless network" (from 35% to 26%) being the additional IT facilities or services that were the most needed for students' and teachers' use in MS2.

Table 6.98 Facilities/services which were mostly needed and should be upgraded to provide an environment conducive to ITEd in schools ([P2]HQ7) and additional facilities/services which schools wished to be prioritized for teachers' and students' use ([P2]HQ8).

IT facilities/services	**Percentage (%)**					
	Mostly needed upgraded facilities/services			**Prioritized additional facilities/services**		
	MS1 (N=496)	**MS2 (N=440)**	***P*-value**	**MS1 (N=524)**	**MS2 (N=440)**	***P*-value**
Multi-media computer rooms	53	48	0.106	40	30	0.002**
Computers and projectors in classroom	58	57	0.807	46	40	0.072
E-learning platform[#]	53	45	0.021*	47	36	0.000***
Wireless network	35	25	0.001**	35	26	0.004**
School campus digital TV	31	28	0.239	37	41	0.214
Mobile learning devices (e.g. Personal Digital Assistant (PDA), Pocket Personal Computer (PC))	29	32	0.324	41	49	0.015*
Broadband internet connection	11	10	0.682	6	5	0.305
Digital tools (e.g. digital cameras)	11	20	0.000***	11	17	0.007**
Interactive electronic whiteboard	10	25	0.000***	24	40	0.000***
Video conferencing devices	5	7	0.251	11	13	0.484
E-mail	2	2	0.797	0	0	0.861
Others (Please specify)	1	0	0.050*	1	3	0.071

Three option selections; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

6.6 Providing Continuous Research and Development

The sixth strategic goal of the Second ITEd Strategy is "Providing continuous research and development". This strategy aims at doing research on the effectiveness of the ITEd strategy and the impact of IT on students' learning outcome as well as pioneering leading edge IT applications in pedagogy, education resources, school practices, curriculum integration and systems development.

School heads tended to be satisfied with their schools actively taking part in pilot projects or schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching — a statistically significant increase was noted in school heads' level of satisfaction with continuous research and development in ITEd in MS2

Table 6.99 ([P1]HSQ8a-c) shows that 25% to 39% of school heads were satisfied or very satisfied with the three listed outcomes regarding the continuous research and development in ITEd in MS1. 39% of school heads were satisfied or very satisfied that their schools actively took part in pilot projects or pilot schemes to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching. 28% of them were satisfied or very satisfied that their schools actively studied or evaluated the effectiveness of some innovative IT pedagogical strategies and shared the experience with the education community. Regarding the research-based projects, a quarter (25%) of school heads were satisfied or very satisfied that the EMB could share the results of these projects with schools in order to assist them in the promotion of ITEd. All mean values fell in the range of 3.07 to 3.32 (SD:0.75-0.79) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. A statistically significant increase in all of the above three listed outcomes (MS1: 25%-39%; MS2: 32%-45%) was noted in MS2.

Around a quarter of the primary schools had launched pilot schemes or projects on the use of IT for teaching — a statistically significant decrease was noted in the percentage of schools collaborating with local community or commercial organisations in MS2

The EMB has encouraged innovative use of IT in education and has initiated some pilot schemes in primary schools in collaboration with organisations or institutions in the community. The extent of participation of schools in such ITEd innovation projects revealed the level of achievement in this aspect. In MS1, 23% of schools had launched pilot schemes or projects on the use of IT for teaching in the school year of 2004/05. 41% of them had launched similar pilot schemes or projects with other organisations. Of these, 50% of schools collaborated with local tertiary institutions, 46% with local community or commercial organisations and 40% with the EMB. A statistically significant decrease in the percentage of schools collaborating with local community or commercial organisations (from 46% to 19%) was identified in MS2 (Table 6.100, [P2]HQ16a-c).

Teachers expressed a neutral(一般) attitude towards the usefulness of the EMB support or resources, such as sharing the results of research-based projects with schools, in developing their ability in using IT for teaching

The EMB provided various support and resources in sharing the results of research-based projects, such as electronic school bag and interactive electronic whiteboard, with schools. In MS1, about a quarter of the teachers (24%) agreed or strongly agreed that the EMB support or resources were useful in developing their ability in using IT for teaching, with a mean rating of 3.09 (SD:0.66) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. No statistically significant difference was noted in MS2 (Table 6.101, [P5]TQ19e).

Table 6.99 School heads' levels of satisfaction with continuous research and development in ITEd ([P1]HSQ8a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied	
a.	3.32	0.79	551	33	(6)	182	(33)	266	(48)	66 (12)	3.42	0.75	445	27	(6)	175	(39)	203	(46)	38 (9)	0.027*
b.	3.15	0.75	551	21	(4)	133	(24)	307	(56)	85 (15)	3.32	0.74	445	24	(5)	142	(32)	235	(53)	41 (9)	0.000***
c.	3.07	0.76	551	13	(2)	129	(23)	302	(55)	97 (18)	3.20	0.76	445	18	(4)	123	(28)	237	(53)	63 (14)	0.012*

	Totally not satisfied					*P*-value
				Totally not satisfied		
a.	4	(1)		2	(0)	0.027*
b.	5	(1)		3	(1)	0.000***
c.	10	(2)		4	(1)	0.012*

Aspects related to continuous research and development in ITEd

a. The school actively takes part in pilot projects or pilot schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching.

b. The school actively studies or evaluates the effectiveness of some innovative IT pedagogical strategies and to share the experience with the education community.

c. The Education and Manpower Bureau can share the results of research-based projects (e.g. electronic school bag and interactive white board) with schools to assist schools in the promotion of ITEd.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.100 School heads' reported on the pilot schemes on the use of IT for teaching in their schools in the 2004/05 and 2005/06 school years ([P2]HQ16a-c)

Pilot schemes	Percentage (%)		*P*-value
	MS1 (N=522)	MS2 (N=423)	
YES	23	22	0.541
NO	77	78	
Collaboration with other organisations	**(N=121)**	**(N=91)**	
YES	41	52	0.136
NO	59	48	
Organisations	**(N=50)**	**(N=47)**	
Local tertiary institutions	50	64	0.172
Local community/commercial organisations	46	19	0.005**
Education and Manpower Bureau	40	34	0.546
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	32	34	0.832
Local primary, secondary, and special schools	30	32	0.839
Oversea schools/community organisations/commercial organisations/tertiary institutions	8	9	0.928

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.101 Teachers' levels of agreement on the usefulness of the support/resources provided by the Education and Manpower Bureau to develop teachers' ability in using IT ([P5]TQ19e)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option										*P*-value
				Strongly agree		Agree		Neutral (一般)		Disagree		Strongly disagree		
Levels of agreement of the usefulness on the support/resources by Education and Manpower Bureau [e.g. sharing the results of research-based projects (e.g. electronic school bag and interactive electronic whiteboard) with schools] to develop teachers' ability in using IT for teaching														
MS1	3.09	0.66	1816	10	(1)	421	(23)	1143	(63)	210	(12)	32	(2)	0.374
MS2	3.12	0.66	1791	21	(1)	412	(23)	1141	(64)	190	(11)	27	(2)	

Mean: 1= "Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers had some participation in exploring new technology as well as researching and evaluating the effectiveness of ITEd in schools

In MS1, 36% of the ITEd Team teachers perceived that they had considerable or strong participation in exploring new technology such as wireless system and developing innovative teaching methods when implementing school ITEd plans whereas 25% of them perceived that they had little participation or no participation at all. The mean rating was 3.10 (SD:1.15) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation' (Table 6.102, [P4]ITQ3i). 35% of them perceived that they had considerable or strong participation in performing research and evaluation on the effectiveness of ITEd in school while 26% perceived that they had little participation or no participation in doing so, with a mean rating of 3.06 (SD:1.05) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation'. No statistically significant difference was identified in these two areas in MS2 (Table 6.102, [P4]ITQ3j).

Table 6.102 ITEd Team teachers' perception of their participation in different tasks when implementing school ITEd plan ([P4]ITQ3i,j)

	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option										*P*-value
				Strong participation		Considerable participation		Some participation (一般)		Little participation		None		
"To explore new technology (e.g. wireless network system) and develop innovative teaching methods."														
MS1	3.10	1.15	334	38	(11)	85	(25)	125	(37)	45	(13)	41	(12)	0.259
MS2	3.02	1.04	332	22	(7)	84	(25)	136	(41)	58	(17)	32	(10)	
"To research and evaluate on the effectiveness of ITEd in school"														
MS1	3.06	1.05	334	23	(7)	94	(28)	131	(39)	53	(16)	33	(10)	0.677
MS2	3.02	1.06	332	20	(6)	91	(27)	136	(41)	46	(14)	39	(12)	

Mean: 1= 1= "None" and 5="Strong participation"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7 Promoting Community–wide Support and Community Building

The seventh strategic goal of the Second ITEd Strategy is "Promoting community-wide support and community building". This strategy aims to enhance home-school co-operation and community-school collaboration. Two key areas in home-school co-operation were studied. First of all, parents are encouraged to involve in ITEd with regard to motivating their children towards the appropriate use of IT and delivering home messages on cyber ethics. Secondly, schools are encouraged to enhance communication with parents through the use of IT. Community-school collaboration, such as school support from the IT industry, NGOs and community organisations, will contribute to ITEd in terms of trainings and providing digital resources and IT facilities. These collaborations will help to address the digital divide issue and will ultimately help the building of the community.

The sections below examine the following aspects:

- Home-school co-operation and parents' involvement
- Community-wide involvement
- Digital divide

6.7.1 Home-school Co-operation and Parents' Involvement

The extent of schools' initiatives in home-school co-operation, including measures to enhance communication between schools and parents as well as parents' involvement in the promotion of ITEd and their satisfaction with these collaboration activities or programmes, are discussed in this section.

6.7.1.1 Home-school Co-operation

School heads tended to be satisfied with their schools setting up concrete programmes to encourage parents' involvement in ITEd – a statistically significant increase was noted in this aspect in MS2

Regarding the concrete programmes that schools set up to encourage parents' involvement in and promotion of related work on ITEd, 38% of school heads in MS1 were satisfied or very satisfied with this aspect. A statistically significant increase to 46% was noted in MS2 (Table 6.103, [P1]HSQ7a).

Table 6.103 School heads' levels of satisfaction with their schools setting up concrete programmes to encourage parents' involvement in and promotion of related work on ITEd ([P1]HSQ7a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school sets up concrete programme(s) to encourage parents' involvement in and promotion of related work on ITEd."									
MS1	3.30	0.71	551	17 (3)	195 (35)	276 (50)	62 (11)	1 (0)	0.001**
MS2	3.45	0.62	445	12 (3)	193 (43)	223 (50)	16 (4)	1 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common measure in which schools or Parent-Teacher Associations carried out to encourage parents' participation in related work of ITEd in schools was encouraging parents to understand situations in schools through visiting school websites or intranets – a statistically significant increase was found in the percentages of schools taking measures to encourage parents' participation in related work of ITEd in schools in MS2

School heads were asked about the attempts that their schools or the Parent-Teacher Associations in schools made in organising home-school collaboration activities or measures. In MS1, the three most common measures were encouraging parents to understand the situation in schools through visiting the school websites or intranets (87%), encouraging parents to instill proper principles, values and attitude in the use of IT into their children (76%) as well as providing ITEd activities for parents (70%). The percentages of schools that had taken these three measures significantly increased in MS2. They were 91%, 86% and 82% respectively. In MS1, 58% of school heads indicated that they explained the work of ITEd in schools to parents, but no statistically significant difference was found in MS2 (Table 6.104, [P2]HQ13a-d).

Table 6.104 Activities/measures which schools/Parent-Teacher Associations organised/ carried out to encourage parents' participation in related work of ITEd in schools in the 2004/05 and 2005/06 school years ([P2]HQ13a-d)

Measures taken to encourage parents' participation in related work of ITEd in school	Percentage (%)		*P*-value
	MS1 (N=537)	MS2 (N=435)	
a. Encouraged parents to visit the school website/intranet so as to understand the situation in school (e.g. IT in Education)	87	91	0.034*
d. Encouraged parents to instill the proper principles, values and attitude in the use of IT into their child/children	76	86	0.000***
b. Provided ITEd activities for parents	70	82	0.000***
c. Explained the work of ITEd in school to parents	58	60	0.650

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common activity participated by parents was basic computer operation course

With regard to the participation of parents in ITEd-related programmes or activities organised by schools in the 2004/05 and 2005/06 school year, a low participation rate of 23% was reported in both MS1 and MS2 (Table 6.105, [P7]PQ17). Of which, the most common activity participated by parents in MS1 was "basic computer operation course" (54%). A relatively smaller proportion of the parents indicated that they participated in "Internet information course" (28%), followed by the "Parent-Child IT learning workshop" (16%), "talks on teaching children in learning IT" (14%) and "talks on teaching children in using IT properly" (13%). In MS2, a statistically significant increase was noted in parents' participation in the activities of "talks on teaching children in using IT properly" (from 13% to 20%), but there was a statistically significant decrease in parents' participation in "Internet information course" (from 28% to 22%) (Table 6.105, [P7]PQ18).

Table 6.105 Parents' participation in ITEd programmes/activities organised by schools in the 2004/05 and 2005/06 school years ([P7]PQ17,18)

Parents' participation in ITEd programme/activity	Percentage (%)		*P*-value
	MS1 (N=3012)	MS2 (N=3391)	
YES	23	23	0.106
NO	77	77	
Modes of IT in Education programmes/activities	**(N=685)**	**(N=788)**	
Basic computer operation course	54	48	0.054
Internet information course	28	22	0.008**
Parent-Child IT learning workshop	16	13	0.295
Talks on teaching children in learning IT	14	15	0.985
Talks on teaching children in using IT properly	13	20	0.003**
Others	19	21	0.401

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Parents perceived that ITEd programmes or activities organised by schools for parents were quite sufficient (一般) — a statistically significant increase in parents' perceived level of sufficiency was noted in MS2

When parents were asked about the adequacy of ITEd programmes or activities organised by schools for parents, 26% of them in MS1 considered that they were sufficient or very sufficient and 14% of the parents considered them as insufficient or totally insufficient. The mean rating of this item was 3.13 (SD:0.73) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. There was a statistically significant increase in parents' perceived level of sufficiency of ITEd programmes/activities (from 26% to 30%) in MS2 (Table 6.106, [P7]PQ20).

Around two-thirds of the parents agreed or strongly agreed that ITEd programmes or activities could enhance parent-child relationship and their understanding of the ITEd policy in their children's schools

With respect to the effectiveness of ITEd programmes or activities, parents indicated a positive attitude towards the outcomes derived from these activities. In MS1, 57% to 65% of the parents strongly agreed or agreed that these programmes or activities enhanced parent-child relationship (65%), followed by their understanding of the ITEd policy in their children's schools (60%), enhanced their IT proficiency (58%) and increased their interest in IT (57%). No statistically significant difference was found in MS2 on these aspects (Table 6.106, [P7]PQ21a-d).

Parents tended to be willing to participate in ITEd programmes/activities — a statistically significant decrease was noted in parents' willingness in MS2

When parents were asked to show their willingness to participate in ITEd programmes or activities in the future, 49% of them in MS1 were willing or very willing to participate in these activities in the future whereas 10% indicated that they were not very willing or totally not willing to do so. The mean rating of this item was 3.68 (SD:0.72) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. The percentage significantly dropped statistically to 45% in MS2 (Table 6.106, [P7]PQ22).

Table 6.106 Parents' perception of levels of sufficiency, agreement of the outcomes and willingness to participate in ITEd programmes/activities organised by the schools ([P7]PQ20-22)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Parents choosing the option							Mean (1-5)	SD	N	Count (%) of Parents choosing the option							
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient	
Levels of sufficiency of ITEd programmes/activities for parents (Mean: 1="Totally insufficient" and 5="Very sufficient")	3.13	0.73	685	25	(4)	150	(22)	411	(60)	89 (13)	3.21	0.72	788	27	(3)	213	(27)	457	(58)	81 (10)	0.037*
Outcomes derived from IT in Education programmes/activities	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Parents choosing the option							Mean (1-5)	SD	N	Count (%) of Parents choosing the option							
				Strongly agree		Agree		Neutral		Disagree				Strongly agree		Agree		Neutral		Disagree	
a. Enhance your understanding of the ITEd policy in your child's school	3.68	0.68	685	58	(8)	354	(52)	262	(38)	10 (1)	3.68	0.66	788	64	(8)	430	(55)	272	(35)	20 (2)	0.859
b. Increase your interest in IT	3.61	0.72	685	51	(7)	341	(50)	261	(38)	28 (4)	3.58	0.71	788	53	(7)	391	(50)	306	(39)	33 (4)	0.652
c. Enhance your IT proficiency	3.58	0.75	685	49	(7)	346	(51)	247	(36)	37 (5)	3.57	0.70	788	93	(12)	412	(52)	256	(32)	20 (3)	0.528
d. Enhance parent-child relationship	3.74	0.75	685	81	(12)	364	(53)	216	(32)	19 (3)	3.73	0.74	788	93	(12)	412	(52)	256	(32)	20 (3)	0.595
(Mean: 1="Strongly disagree" and 5="Strongly agree")																					
	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Parents choosing the option							Mean (1-5)	SD	N	Count (%) of Parents choosing the option							
				Very willing		Willing		Maybe (一般)		Not very willing (不願意)				Very willing		Willing		Maybe (一般)		Not very willing (不願意)	
Levels of willingness to participate in ITEd programmes/activities to be organised in schools (Mean: 1="Totally not willing" and 5="Very willing")	3.68	0.72	3288	202	(6)	1414	(43)	1326	(40)	299 (9)	3.37	0.77	3601	162	(5)	1443	(40)	1580	(44)	385 (11)	0.000***

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7.1.2 Parents' Use of IT as a Communication Tool

The use of e-learning platform as a communication tool amongst parents, teachers and schools was not common

Regarding the use of e-learning platforms as a tool for communication, around half of the parents in MS1 (53%) had heard about the platforms. Among the parents who had heard about e-learning platforms, 15% of them frequently or very frequently visited the platforms whereas 42% of them rarely or never visited the platforms. The mean value of this item was 2.67 (SD:1.04) on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 6.107, [P7]PQ9a,b). Regarding the effective use of e-learning platforms by schools for communication purpose among parents, schools and teachers, 37% of the parents agreed or strongly agreed that it was effective, with a mean rating of 3.26 (SD:0.77) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 6.107, [P7]PQ9e). In MS2, a statistically significant increase was noted in the percentages of parents who had heard about e-learning platforms provided by the schools (from 53% to 56%). No statistically significant difference was found in two other aspects listed in Table 6.107.

Table 6.107 Parents' levels of frequency in visiting e-learning platforms and their levels of agreement to schools' effective use of the platforms to promote communication amongst parents, schools and teachers ([P7]PQ9a,b,e)

Whether parents had heard about the e-learning platform provided by the schools	**Percentage (%)**		**_P_-value**
	MS1 (N=3259)	**MS2 (N=3575)**	
YES	53	56	0.035*
NO	47	44	

	Mean (1-5)	**SD**	**N**	**Count (%) of Parents choosing the option**					**_P_-value**
				Very Frequently	**Frequently**	**Occasionally (間中)**	**Rarely**	**Never**	
Levels of frequency that parents visited the e-learning platforms (Mean: 1="Never" and 5="Very frequently")									
MS1	2.67	1.04	1725	109 (6)	154 (9)	747 (43)	482 (28)	233 (14)	0.504
MS2	2.65	0.99	2003	101 (5)	178 (9)	919 (46)	531 (27)	273 (14)	

	Mean (1-5)	**SD**	**N**	**Count (%) of Parents choosing the option**					**_P_-value**
				Strongly agree	**Agree**	**Neutral (一般)**	**Disagree**	**Strongly disagree**	
Levels of agreement that the school could effectively use the e-learning platform to promote their communication with the school and teachers (Mean: 1="Strongly disagree" and 5="Strongly agree")									
MS1	3.26	0.77	1725	68 (4)	569 (33)	846 (49)	216 (13)	25 (1)	0.665
MS2	3.27	0.74	1993	68 (3)	663 (33)	1023 (51)	222 (11)	17 (1)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Similar to the perception of parents, a small proportion of the teachers showed positive attitude towards the use of e-learning platforms to communicate with parents. Around one-third of the teachers (32%) in MS1 expressed that they were willing or very willing to make use of the platforms to communicate with parents, with a mean rating of 3.13 (SD:0.77) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing' ([P5]TQ11e). When looking at the practice of teachers in this regard, an extremely small proportion of the teachers (3%) in MS1 reported that they frequently or very frequently used e-learning platforms to communicate with parents. 83% of them expressed that they rarely or never used the platforms for this purpose. The mean rating of this item was 1.67 (SD:0.85) on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. Although there was a statistically significant drop in the percentage of the teachers who rarely or never used e-learning platforms to communicate with parents in MS2 (from 83% to 72%), the platform was still not a common means for teachers to communicate with parents ([P5]TQ11f).

Table 6.108 Teachers' levels of willingness and frequency in the use of e-learning platforms to communicate with parents ([P5]TQ11e,f)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	
Levels of willingness of teachers making use of the e-learning platform to communicate with parents (Mean: 1="Totally not willing" and 5="Very willing")									
MS1	3.13	0.77	1777	23 (1)	551 (31)	886 (50)	272 (15)	45 (3)	0.455
MS2	3.11	0.81	1756	25 (1)	538 (31)	876 (50)	245 (14)	72 (4)	
	Mean (1-5)	**SD**	**N**	**Count (%) of Teachers choosing the option**					***P*-value**
				Very Frequently	**Frequently**	**Occasionally (間中)**	**Rarely**	**Never**	
Levels of frequency that teachers used the e-learning platform to communicate with parents (Mean: 1="Never" and 5="Very frequently")									
MS1	1.67	0.85	1773	4 (0)	56 (3)	244 (14)	511 (29)	958 (54)	0.000***
MS2	1.94	0.95	1750	10 (1)	94 (5)	396 (23)	537 (31)	713 (41)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7.1.3 Roles of Parents to Ensure Students' Understanding of Ethical, Legal and Health Issues Involved in Using IT

Parents were generally concerned about ethical, legal and health issues in relation to students' use of IT

The EMB has encouraged schools and the Parent-Teacher Associations to hold activities related to cyber ethics for parents. As stated in 6.7.1.1, a relatively high proportion of schools or Parent-Teacher Associations (MS1: 76%; MS2: 86%) carried out activities or measures to encourage parents to instill proper principles, values and attitude in the use of IT into their children (Table 6.104, [P2]HQ13d). 13% and 20% of the parents participated in the talks on teaching children to use IT properly in MS1 and MS2 respectively (Table 6.105, [P7]option 4 of PQ18). Most of them showed their concerns about the ethical, legal and health issues involved in using IT. Table 6.109 ([P7]PQ14) showed a list of such concerns in which "avoid spending long hours on computer or online games" (89%) was parents' major concern. Their second major concern was "do not disclose personal particulars to strangers" (80%), followed by "do not visit pornographic websites" (78%). Other options such as "beware of e-mail bombs or the spread of computer virus", "do not use pirated (illegal) software" and "do not send or forward unnecessary e-mail or messages" were also important issues concerned by 59% or more of the parents. A statistically significant increase was noted in the following concerns in MS2: "do not use pirated software" (from 64% to 70%), "avoid spending long hours on computer or online games" (from 89% to 92%), "do not visit pornographic websites" (from 78% to 81%) and "do not send or forward unnecessary e-mail or messages" (from 59% to 62%).

Table 6.109 Parents' concerns about ethical, legal and health issues in relation to students' use of IT ([P7]PQ14)

Social and ethical issues in relation to students' use of IT	Percentage (%) of Parents choosing the option		*P*-value
	MS1 (N=3338)	MS2 (N=3611)	
Avoid spending long hours on computer/online games	89	92	0.000***
Do not disclose personal particulars to strangers	80	81	0.786
Do not visit pornographic websites	78	81	0.013*
Beware of E-mail bombs or the spread of computer virus	67	68	0.896
Do not use pirated (illegal) software	64	70	0.000***
Do not send/forward unnecessary E-mail/messages	59	62	0.029*

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7.1.4 Parents as Supporters and Motivators for Students' Learning with IT

"To provide IT facilities at home" and "to monitor their children's use of Internet and assist them to develop the right online learning attitude" were the two most important types of parental support perceived by school heads

When school heads were asked to rate the level of importance against parental support for students' learning with IT (Table 6.110, [P2]HQ12a-f), as reported in MS1, most of them indicated that monitoring children's use of the Internet and assisting them to develop the right online learning attitude (rated as important or very important by 97%) as well as the provision of IT facilities at home (rated as important or very important by 95%) were the two most important options. These were followed by understanding their children's learning situation through visiting the school e-learning platform (93%) and homepage or intranet (92%) as well as setting a good example by learning in a new era through learning about IT (91%). Choosing "suitable digital resources for their child apart from those provided by teachers" was considered as the least important types of parental support among the listed items by school heads, but the perception was still positive (86% felt important or very important). These findings showed that school heads expressed high expectations on parental support for the implementation of ITEd. The mean ratings of all items fell in the range of 4.07 to 4.56 (SD:0.57-0.66) on a scale of 1 to 5 where 1 was 'totally not important' and 5 was 'very important'. No statistically significant difference was noted in MS2 for these items.

Most students had computers and broadband Internet access at home

As indicated by school heads, provision of IT facilities at home was one of the most important parental support for students' learning with IT after school. When parents and students were asked about the home ownership of computers, 89% or more of the parents and students (93% of parents, 89% of P4 and 93% of P6 students) reported that they had computers at home in MS1 (Table 6.111, [P7]PQ11, [P6]SQ8a). Regarding connectivity to the Internet, most of the parents and students (94% of parents, 87% of P4 and 93% of P6 students) reported that they could access the Internet at home with 92% of the parents reported using broadband and 8% dial up connection in MS1 (Table 6.111, [P7]PQ12a,b, [P6]SQ8c). A statistically significant increase was noted in the percentages of parents (from 94% to 95%) and P6 students (from 93% to 96%) having Internet access at home in MS2. This broad picture indicated that computers were quite widely available at home for primary school students.

Students perceived the IT facilities at home as sufficient and they were satisfied with the speed of Internet connection at home

Regarding the extent of opportunity for students to use computers at home, 72% of the parents in MS1 reported that their children had opportunity to use computers frequently or very frequently at home, with a mean rating of 4.12 (SD:0.98) on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 6.112, [P7]PQ13). The percentage was significantly decreased statistically to 70% in MS2. Regarding students' perception of the adequacy of IT facilities at home, about three quarters of the students in MS1 (79% of P4, 74% of P6) considered that they were sufficient or very sufficient, with mean ratings of 4.15 (SD:1.06) and 3.99 (SD:1.04) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 6.112, [P6]SQ8b). A statistically significant increase was observed in P6 students' perceived level of sufficiency of IT facilities at home (from 74% to 76%) in MS2. Similar percentages of the students (76% of P4, 73% of P6) in MS1 were satisfied or very satisfied with the speed of Internet connection at home, with mean ratings of 4.08 (SD:0.99) and 3.98 (SD:1.03) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 6.112, [P6]SQ8d). No statistically significant difference in the level of satisfaction with the speed of Internet connection at home was found in MS2.

Table 6.110 School heads' perception of the importance of parental support/encouragement to students' use of IT in learning ([P2]HQ12a-f)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very important		Important		Quite important (一般)		Not important		Totally not important										
a.	4.56	0.64	539	338	(63)	171	(32)	25	(5)	4 (1)	1	(0)	4.48	0.70	439	248	(56)	164	(37)	17 (4)	8 (2)	2 (0)	0.055
b.	4.07	0.65	539	123	(23)	342	(63)	62	(12)	12 (2)	0	(0)	4.06	0.63	439	95	(22)	284	(65)	53 (12)	7 (2)	0 (0)	0.780
c.	4.55	0.57	539	316	(59)	204	(38)	18	(3)	1 (0)	0	(0)	4.57	0.54	439	260	(59)	168	(38)	11 (3)	0 (0)	0 (0)	0.753
d.	4.27	0.58	539	183	(34)	318	(59)	38	(7)	0 (0)	0	(0)	4.20	0.65	439	137	(31)	260	(59)	38 (9)	2 (0)	2 (0)	0.186
e.	4.28	0.60	539	193	(36)	304	(56)	41	(8)	1 (0)	0	(0)	4.24	0.65	439	149	(34)	252	(57)	34 (8)	2 (0)	2 (0)	0.475
f.	4.32	0.66	539	225	(42)	263	(49)	48	(9)	2 (0)	1	(0)	4.36	0.61	439	188	(43)	221	(50)	30 (7)	0 (0)	0 (0)	0.444

Parental support/encouragement

a. To provide IT facilities at home

b. To choose other suitable digital resources for their child (children) apart from those provided by teachers

c. To monitor their child's (children's) use of the Internet and assist them to develop the right online learning attitude

d. To visit the school e-learning platform[#] so as to understand their child's (children)'s learning situation

e. To visit the intranet/school homepage so as to understand their child's (children)'s learning situation

f. To set a good example by learning in a new era through learning about IT

Mean: 1="Totally not important" and 5="Very important"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

Table 6.111 Students' home ownership of IT facilities ([P6]SQ8a,c, [P7]PQ11,12a,b)

	P4 students			P6 students			Parents				
Having computers at home	**MS1 (N=1787)**	**MS2 (N=1953)**	**P-value**	**MS1 (N=1949)**	**MS2 (N=2057)**	**P-value**	**MS1 (N=3264)**	**MS2 (N=3633)**	**P-value**		
YES	89	89	0.496 [a]	93	95	0.176 [a]	93	94	0.093[a]		
NO	11	11		7	5		7	6			
Having Internet access at home	**(N=1591)**	**(N=1741)**		**(N=1822)**	**(N=1949)**		**(N=2814)**	**(N=3254)**			
YES	87	88	0.321 [a]	93	96	0.000*** [a]	94	95	0.019* [a]		
NO	13	12		7	4		6	5			
Type of Internet connection							**(N=2648)**	**(N=3053)**	$\chi^2_{(df=1)}$	***P*-value**	
Broadband	-	-		-	-		92	92	0.028	0.867[b]	
Dialup	-	-		-	-		8	8			

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.112 Parents' perception of the opportunities for students to use computers at home ([P7]PQ13) and students' perception of the sufficiency levels of IT facilities at home as well as their satisfaction levels with the speed of Internet connection at home ([P6]SQ8b,d)

Stakeholders		Mean (1-5)	SD	N	Count (%) Parents choosing the option					*P*-value
					Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	
Opportunity for students to use the computer(s) at home (Mean: 1="Never" and 5="Very frequently")										
Parents	MS1	4.12	0.98	2946	1428 (48)	698 (24)	666 (23)	135 (5)	19 (1)	0.000***
	MS2	4.07	0.97	3297	1446 (44)	848 (26)	809 (25)	179 (5)	15 (0)	
Class levels		**Mean (1-5)**	**SD**	**N**	**Count (%) Students choosing the option**					***P*-value**
					Very sufficient	**Sufficient**	**Quite sufficient (一般)**	**Insufficient**	**Totally Insufficient**	
Levels of sufficiency of IT facilities at home (Mean: 1="Totally insufficient" and 5="Very sufficient")										
P4	MS1	4.15	1.06	1591	774 (49)	472 (30)	214 (13)	70 (4)	62 (4)	0.270
	MS2	4.22	1.00	1741	891 (51)	504 (29)	227 (13)	77 (4)	42 (2)	
P6	MS1	3.99	1.04	1822	690 (38)	660 (36)	295 (16)	121 (7)	56 (3)	0.017*
	MS2	4.08	0.98	1949	787 (40)	707 (36)	318 (16)	94 (5)	43 (2)	
Class levels		**Mean (1-5)**	**SD**	**N**	**Count (%) Students choosing the option**					***P*-value**
					Very satisfied	**Satisfied**	**Quite satisfied (一般)**	**Not satisfied**	**Totally not satisfied**	
Levels of satisfaction with the speed of Internet connection at home (Mean: 1="Totally not satisfied" and 5="Very satisfied")										
P4	MS1	4.08	0.99	1379	574 (42)	470 (34)	248 (18)	49 (4)	38 (3)	0.269
	MS2	4.13	0.98	1536	673 (44)	525 (34)	238 (15)	62 (4)	38 (2)	
P6	MS1	3.98	1.03	1702	625 (37)	618 (36)	315 (19)	86 (5)	58 (3)	0.172
	MS2	4.01	1.06	1867	735 (39)	660 (35)	294 (16)	107 (6)	71 (4)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common parental support was allowing their children to read IT-related books

Parents were further asked about ways in which they showed support for their children's learning with the use of IT (Table 6.113, [P7]PQ15). In MS1, the most common support was allowing their children to read IT-related books (36%), followed by allowing them to attend IT courses (33%), encouraging them to make use of community resources such as computer facilities in community centres and digital resources in libraries (32%) as well as buying educational software (29%) and IT-related hardware or software (28%) for them. No more than 20% of the parents indicated that they supported their children by reading IT-related books themselves (20%), attending IT course themselves (15%) and participating in IT learning with their children (14%). A statistically significant decrease to13% in the percentage of parents attending IT courses themselves was found in MS2.

Table 6.113 Ways of parental support for their children on using IT in learning ([P7]PQ15)

Ways of parental support	Percentage (%)		*P*-value
	MS1 (N=3338)	MS2 (N=3587)	
Allowing your child to attend IT courses	33	32	0.519
Attending IT courses yourself	15	13	0.008**
Allowing your child to read IT -related books	36	36	0.938
Reading IT-related books yourself	20	19	0.057
Buying IT-related hardware/software for your child	28	28	0.675
Encouraging your child to make use of community resources (e.g. computer facilities in community centres and digital resources in libraries)	32	31	0.241
Buying educational software for your child	29	28	0.270
Participating in IT learning with your child	14	12	0.016
Other support	27	25	0.007*
No special support	21	23	0.019

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Primary school students were satisfied with the technical and learning support from family

Other types of family support include technical support and learning support. In MS1, more than 70% of the students were satisfied or very satisfied with the technical support (78% of P4 and 71% of P6) and learning support (83% of P4 and 75% of P6) from family. A statistically significant increase was observed in P6 students' level of satisfaction with the technical support from family (from 71% to 74%) in MS2 (Table 6.114, [P6]SQ9b.ii, SQ15c.ii). Students' responses revealed a reasonable level of satisfaction with the support from family.

Table 6.114 Students' levels of satisfaction with the technical support and learning support from family ([P6]SQ9b.ii, 15c.ii)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option					*P*-value
					Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
Levels of satisfaction with the technical support from family										
P4	MS1	4.18	1.09	1783	932 (52)	456 (26)	250 (14)	64 (4)	80 (4)	0.998
	MS2	4.20	1.04	1953	1006 (52)	530 (27)	285 (15)	57 (3)	76 (4)	
P6	MS1	3.96	1.07	1947	743 (38)	640 (33)	391 (20)	95 (5)	78 (4)	0.048*
	MS2	4.04	1.01	2057	825 (40)	698 (34)	392 (19)	75 (4)	67 (3)	
Levels of satisfaction with the learning support from family										
P4	MS1	4.30	0.94	1139	621 (55)	316 (28)	154 (14)	16 (1)	31 (3)	0.562
	MS2	4.35	0.87	1242	688 (55)	346 (28)	176 (14)	14 (1)	18 (1)	
P6	MS1	4.06	0.99	1209	489 (40)	418 (35)	229 (19)	35 (3)	38 (3)	0.525
	MS2	4.13	0.90	1300	533 (41)	474 (36)	242 (19)	30 (2)	21 (2)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Parents tended to be willing to invest more resources for their children to use IT in learning

Parents showed positive attitude and contributed in various ways to support students' learning with IT. In MS1, 47% of the parents were willing or very willing to invest more resources such as time and money for their children to use IT in learning, with a mean rating of 3.47 (SD:0.72) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. No statistically significant difference was found in MS2 (Table 6.115, [P7]PQ16).

Table 6.115 Parents' levels of willingness to invest more resources for their children to use IT in learning [P7]PQ16)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	
MS1	3.47	0.72	3226	194 (6)	1334 (41)	1504 (47)	172 (5)	22 (1)	0.164
MS2	3.44	0.72	3526	165 (5)	1495 (42)	1634 (46)	196 (6)	36 (1)	

Mean: 1="Totally not willing" and 5="Very willing"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7.2 Community-wide Involvement

Promoting community-wide support is emphasized by the EMB. This support could be enhanced by collaborative schemes and partnership with private sector and NGOs in terms of training for teachers or IT technical staff and providing digital resources. The extent of schools making use of community resources and taking part in school-community collaboration activities indicates the achievement of the EMB measures in this regard.

6.7.2.1 Community-school Collaboration

Amongst those schools which launched pilot schemes or sharing activities, around half of the schools collaborated with "local tertiary institutions" and "local community or commercial organisations" to launch pilot projects while around two-fifths of the schools collaborated with "local primary, secondary and special schools" and "local community or commercial organisations" to organise sharing activities on the use of IT for teaching in MS1

The extent of the involvement of schools in community-school collaboration activities is studied in this survey. School heads were asked about how their schools collaborated with community organisations in pilot schemes or sharing activities on the use of IT for teaching. Among the 121 primary schools which launched pilot projects on the use of IT for teaching in the 2004/05 school year in MS1, around two-fifths of these schools (41%) collaborated with other organisations (Table 6.100, [P2]HQ16a,b). 50% of these schools collaborated with "local tertiary institutions", 46% with "local community or commercial organisations" and 40% with the "EMB". Very few of them (8%) collaborated with overseas schools/community organisations/commercial organisations/ tertiary institutions. No statistically significant difference was found in the percentages of schools organising collaboration activities with other organisations in MS2 except with "local community or commercial organisations" (from 46% to 19%) (Table 6.116, [P2]HQ16c).

Among the 145 primary schools which organised sharing activities on the use of IT for teaching in the 2004/05 school year, 54% of these schools collaborated with other organisations (Table 6.58, [P2]HQ17a,b). A slightly more than two-fifths of these schools (44%) most often collaborated with "local primary, secondary and special schools", followed by "local community or commercial organisations" (41%), the EMB (35%) and "local tertiary institutions" (30%). 13% and 5% of these schools organised sharing activities with organisations or tertiary institutions in Mainland China and Macao or overseas respectively. No statistically significant difference was found in MS2 (Table 6.116, [P2]HQ17c).

Table 6.116 Organisations which jointly organised pilot schemes and sharing activities on the use of IT for teaching with schools ([P2]HQ16c,17c)

Organisations	**Percentage (%) of School heads choosing the options**					
	Pilot schemes			**Sharing activities**		
	MS1 (N=50)	**MS2 (N=47)**	***P*-value**	**MS1 (N=79)**	**MS2 (N=71)**	***P*-value**
Local primary, secondary, and special schools	30	32	0.839	44	34	0.190
Local community/commercial organisations	46	19	0.005**	41	42	0.829
Education and Manpower Bureau	40	34	0.546	35	31	0.564
Local tertiary institutions	50	64	0.172	30	37	0.420
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	32	34	0.832	13	21	0.166
Oversea schools/community organisations/commercial organisations/tertiary institutions	8	9	0.928	5	3	0.485

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Around 10% of the teachers participated in ITEd professional development programmes or activities run by the IT industries, tertiary institutions and the HKEdCity respectively

Community also provided ITEd professional development programmes or activities for teachers. When teachers were asked about their actual participation in ITEd professional development programmes or activities in the 2004/05 school year, as reported in MS1, these programmes or activities were run by organisations such as their schools (76%) and the EMB (45%). Less than 18% of the teachers indicated that they had participated in the professional development programmes or activities provided by outside bodies like other schools (17%), the HKEdCity (12%), IT industries (12%), tertiary institutions (9%) and other professional or non-governmental organisations (1%-4%). A statistically significant decrease was noted in the percentages of

teachers who had participated in the ITEd professional development programmes/activities organised by the EMB (from 45% to 40%) and other schools (from 17% to 12%) in MS2 (Table 6.117, [P5]TQ22b).

Table 6.117 The organisations that teachers participated in the ITEd professional development programmes/activities ([P5]TQ22b)

Organisations/institutions which organised ITEd professional development programmes/activities	Percentage (%)		*P*-value
	MS1 (N=849)	MS2 (N=732)	
Your school	76	78	0.508
Education and Manpower Bureau [including Centres of Excellence(CoEs)]	45	40	0.036*
Other schools	17	12	0.006**
HKEdCity	12	10	0.237
IT industries	12	10	0.156
Tertiary institutions (Please specify:_____)	9	7	0.179
The Hong Kong Computer Society	4	3	0.17
The Hong Kong Association for Computer Education	4	2	0.076
Hong Kong Professional Teachers' Union	3	2	0.65
Hong Kong Federation of Education Workers	1	1	0.712
Others	1	1	0.285

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7.2.2 Community Resources

School heads were quite satisfied (一般) that their schools made use of community resources and took part in community activities on the promotion of ITEd — a statistically significant increase was found in school heads' satisfaction level in this aspect in MS2

For the use of community resources, 28% of school heads were satisfied or very satisfied that students and parents made appropriate use of community resources such as computer facilities in community centres and digital resources in libraries in MS1. The percentage significantly increased statistically to 40% in MS2 (Table 6.118, [P1]HSQ7d). In MS1, 26% of school heads were satisfied or very satisfied with the expected outcomes that their schools made use of community resources such as Partners in Learning (PiL) and took part in community activities on the promotion of ITEd while the percentage increased to 32% in MS2 (Table 6.118, [P1]HSQ7c).

Table 6.118 School heads' levels of satisfaction with making use of community resources and taking part in community activities on the promotion of ITEd ([P1]HSQ7c,d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option										*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"The school always makes use of community resources [e.g. Partners in Learning (PiL) 育才計劃] and takes part in community activities on the promotion of ITEd."														
MS1	3.14	0.70	551	20	(4)	120	(22)	331	(60)	79	(14)	1	(0)	0.014*
MS2	3.24	0.68	445	14	(3)	129	(29)	253	(57)	49	(11)	0	(0)	
"Students and parents make appropriate use of the community IT facilities and digital resources (e.g. computer facilities in the community centres and digital resources in the libraries)."														
MS1	3.19	0.64	551	8	(1)	150	(27)	335	(61)	56	(10)	2	(0)	0.000***
MS2	3.36	0.62	445	9	(2)	167	(38)	244	(55)	25	(6)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers perceived the support from the community as beneficial and they perceived a higher level of agreement to the benefit of using the community IT facilities or digital resources to help needy students to lessen the digital divide

ITEd Team teachers perceived the support from the community as significant (Table 6.119, [P4]ITQ7d.i-v). In MS1, 78% of the ITEd Team teachers agreed or strongly agreed that the community IT facilities or digital resources could effectively help needy students to lessen the digital divide. Around 70% of them agreed or strongly agreed that the use of community IT facilities or digital resources as beneficial to the following: to enhance sharing and collaboration

on the use of IT for teaching between schools and the community (73%), to provide requisite technical support for the development of ITEd in schools (72%) and to reduce schools' burden in developing IT facilities and digital resources (70%) as well as to provide opportunities for schools to upkeep the latest ITEd development trend in the education sector (66%). The level of agreement on the aforementioned items regarding the benefits of community IT facilities or digital resources significantly dropped statistically (MS1: 70%-78%; MS2: 62%-69%) in MS2 except for the benefit of providing "opportunities for school to upkeep with the latest ITEd development and trend in the education sector".

School heads perceived that the EMB made significant contributions to school development in ITEd

With regard to the extent of the contribution level of the provision of IT facilities and digital resources from the different organisations to ITEd in schools, as reported in MS1, most of school heads (85%) perceived that the EMB made considerable or significant contributions to school development in ITEd. Around 50% thought that the "internet service providers" (54%), "software and hardware service providers" (52%) and "IT application system developers" (46%) made considerable or significant contributions. Lower percentages of school heads considered that "tertiary institutions" (31%), "professional education organisations" (23%), "local primary, secondary and special schools" (22%), "other government policy departments or bureau" (9%) and "community organisations or centres" (7%) made considerable or significant contributions, with mean ratings below 3.00 on a scale of 1 to 5 where 1 was 'none' and 5 was 'significant contribution'. No statistically significant difference was found in MS2 (Table 6.120, [P2]HQ14a.i-xi).

ITEd team teachers perceived that IT facilities or resources provided by the HKEdCity were quite sufficient (一般)

When asked about the sufficiency of community IT facilities or resources as listed in Table 6.121 ([P4]ITQ7b.i-x), 25% or less of the ITEd Team teachers in MS1 found the support provided by the organisations or institutions to be sufficient or very sufficient: the EMB (25%), tertiary institutions (18%), IT-related professional organisations such as Hong Kong Computer Society and Hong Kong Association for Computer Education (14%-15%), non-governmental organisations such as Hong Kong Professional Teachers' Union and Hong Kong Federation of Education Workers (9%-12%) and IT industry (e.g. Partners in Learning) (12%). The mean ratings fell in the range of 2.58 to 2.92 (SD:0.72-0.86) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. The only exception was the HKEdCity. 61% of the ITEd team teachers found the support to be sufficient or very sufficient with a mean rating of 3.62 (SD:0.72) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant decrease (from 61% to 49%) in ITEd Team teachers' perceived level of sufficiency of the IT facilities/resources provided by the HKEdCity to schools was found in MS2.

In general, 21% of the ITEd Team teachers in MS1 perceived the provision of community IT facilities or digital resources to be sufficient or very sufficient, with a mean rating of 2.90 (SD:0.59) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted in MS2 (Table 6.122, [P4]ITQ7c). Similarly, around one-fourth of school heads (26%) considered such resources as sufficient or very sufficient in MS1, with a mean rating of 3.02 (SD:0.75) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. There was a statistically significant increase (from 26% to 31%) in MS2 (Table 6.122, [P2]HQ14b).

Table 6.119 ITEd Team teachers' levels of agreement on the benefits of community IT facilities/digital resources ([P4]ITQ7d.i-v)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							
				Strongly agree		Agree		Neutral		Disagree											
i.	3.75	0.66	334	26	(8)	213	(64)	84	(25)	9	(3)	2	(1)	3.66	0.68	332	22	(7)	192	(58)	101	(30)	17	(5)	0	(0)	0.050*
ii.	3.75	0.78	334	42	(13)	192	(57)	76	(23)	22	(7)	2	(1)	3.61	0.80	332	33	(10)	171	(52)	94	(28)	34	(10)	0	(0)	0.018*
iii	3.90	0.66	334	50	(15)	209	(63)	67	(20)	8	(2)	0	(0)	3.77	0.71	332	42	(13)	185	(56)	92	(28)	13	(4)	0	(0)	0.014*
iv.	3.80	0.65	334	33	(10)	210	(63)	82	(25)	8	(2)	1	(0)	3.67	0.72	332	29	(9)	182	(55)	103	(31)	17	(5)	1	(0)	0.015*
v.	3.74	0.69	334	35	(10)	188	(56)	100	(30)	10	(3)	1	(0)	3.65	0.71	332	26	(8)	184	(55)	104	(31)	17	(5)	1	(0)	0.169

Benefits of community IT facilities/digital resources

i. To provide requisite technical support for the development of ITEd in school
ii. To reduce school's burden in developing IT facilities and digital resources
iii. To help needy students to lessen the digital divide
iv. To enhance sharing and collaboration on the use of IT for teaching between school and the community
v. To provide opportunities for school to upkeep with the latest ITEd development and trend in the education sector

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.120 School heads' perception of contribution from community organisations to ITEd in schools ([P2]HQ14a.i-xi)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							
				Significant contribution		Considerable contribution		Some contribution (一般)		Little contribution		None										
i.	4.20	0.74	539	203	(38)	252	(47)	75	(14)	9	(2)	0	(0)	4.22	0.74	439	167	(38)	212	(48)	51	(12)	8	(2)	1	(0)	0.676
ii.	2.71	0.93	539	6	(1)	87	(16)	259	(48)	116	(22)	71	(13)	2.80	0.93	439	16	(4)	63	(14)	219	(50)	99	(23)	42	(10)	0.253
iii	2.54	0.90	539	8	(1)	43	(8)	265	(49)	141	(26)	82	(15)	2.61	0.88	439	8	(2)	43	(10)	206	(47)	132	(30)	50	(11)	0.420
iv.	2.96	1.00	539	17	(3)	153	(28)	211	(39)	106	(20)	52	(10)	2.94	0.91	439	14	(3)	97	(22)	209	(48)	87	(20)	32	(7)	0.527
v.	2.81	0.97	539	16	(3)	105	(19)	236	(44)	122	(23)	60	(11)	2.88	0.96	439	17	(4)	88	(20)	202	(46)	90	(21)	42	(10)	0.240
vi.	2.87	0.93	539	12	(2)	113	(21)	255	(47)	109	(20)	50	(9)	2.89	0.91	439	8	(2)	97	(22)	214	(49)	80	(18)	40	(9)	0.581
vii.	2.46	0.86	539	2	(0)	36	(7)	259	(48)	152	(28)	90	(17)	2.53	0.89	439	5	(1)	39	(9)	201	(46)	131	(30)	63	(14)	0.344
viii.	2.62	0.95	539	6	(1)	76	(14)	251	(47)	121	(22)	85	(16)	2.65	0.93	439	7	(2)	62	(14)	197	(45)	117	(27)	56	(13)	0.839
ix.	3.46	0.84	539	35	(6)	249	(46)	201	(37)	38	(7)	16	(3)	3.49	0.82	439	35	(8)	196	(45)	165	(38)	36	(8)	7	(2)	0.780
x.	3.49	0.87	539	44	(8)	248	(46)	191	(35)	38	(7)	18	(3)	3.50	0.90	439	46	(10)	193	(44)	146	(33)	42	(10)	12	(3)	0.834
xi.	3.32	0.93	539	34	(6)	216	(40)	212	(39)	45	(8)	32	(6)	3.34	0.93	439	35	(8)	161	(37)	181	(41)	41	(9)	21	(5)	0.917

Organisations

i. Education and Manpower Bureau
ii. Commerce, Industry and Technology Bureau/Innovation and Technology Commission
iii. Other government policy departments/bureau
iv. Tertiary institutions
v. Local primary, secondary and special schools
vi. Professional education organisations
vii. Community organisations/centres
viii. Mass media (e.g. TV and radio)
ix. Software/hardware service providers
x. Internet service providers
xi. IT application system developers

Mean: 1="None" and 5="Significant contribution"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.121 ITEd Team teachers' perception of the sufficiency of IT facilities/resources provided by the community to schools ([P4]ITQ7b.i-x)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option								Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient	
i.	2.92	0.83	334	3	(1)	80	(24)	154	(46)	82	(25)	15	(4)	2.92	0.85	332	9	(3)	63	(19)	167	(50)	77	(23)	16	(5)	0.785
ii.	3.62	0.72	334	24	(7)	180	(54)	110	(33)	18	(5)	2	(1)	3.41	0.75	332	11	(3)	153	(46)	134	(40)	30	(9)	4	(1)	0.000***
iii	2.78	0.86	334	6	(2)	53	(16)	162	(49)	88	(26)	25	(7)	2.72	0.80	332	4	(1)	39	(12)	171	(52)	97	(29)	21	(6)	0.330
iv.	2.76	0.81	334	5	(1)	42	(13)	177	(53)	89	(27)	21	(6)	2.67	0.76	332	3	(1)	27	(8)	183	(55)	97	(29)	22	(7)	0.151
v.	2.78	0.79	334	3	(1)	47	(14)	177	(53)	87	(26)	20	(6)	2.70	0.77	332	3	(1)	31	(9)	184	(55)	91	(27)	23	(7)	0.192
vi.	2.66	0.80	334	3	(1)	36	(11)	165	(49)	105	(31)	25	(7)	2.57	0.79	332	4	(1)	20	(6)	168	(51)	110	(33)	30	(9)	0.153
vii.	2.58	0.80	334	3	(1)	28	(8)	158	(47)	117	(35)	28	(8)	2.52	0.75	332	2	(1)	17	(5)	163	(49)	121	(36)	29	(9)	0.379
viii.	2.75	0.77	334	3	(1)	38	(11)	185	(55)	87	(26)	21	(6)	2.70	0.77	332	3	(1)	35	(11)	175	(53)	99	(30)	20	(6)	0.412
ix.	2.63	0.77	334	2	(1)	28	(8)	176	(53)	101	(30)	27	(8)	2.58	0.75	332	4	(1)	16	(5)	174	(52)	113	(34)	25	(8)	0.297
x.	3.00	1.16	10	1	(10)	2	(20)	4	(40)	2	(20)	1	(10)	2.61	0.85	18	0	(0)	2	(11)	9	(50)	5	(28)	2	(11)	0.358

Organisations

i. Education and Manpower Bureau
ii. HKEdCity
iii. Tertiary institutions
iv. The Hong Kong Computer Society
v. The Hong Kong Association for Computer Education
vi. Hong Kong Professional Teachers' Union
vii. Hong Kong Federation of Education Workers
viii. IT Industries [e.g. Partners in Learning (PiL) 育才計劃]
ix. Voluntary organisations
x. Others

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 6.122 School heads' and ITEd Team teachers' perception of the sufficiency of IT facilities/resources provided by the community to schools ([P2]HQ14b, [P4]ITQ7c)

Stakeholder	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option								Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient	
ITEd Team teachers	2.90	0.59	334	2	(1)	68	(20)	169	(51)	86	(26)	9	(3)	2.88	0.72	332	2	(1)	53	(16)	190	(57)	78	(23)	9	(3)	0.728
School heads	3.02	0.75	539	3	(1)	136	(25)	281	(52)	107	(20)	12	(2)	3.13	0.72	439	2	(0)	135	(31)	229	(52)	66	(15)	7	(2)	0.015*

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7.2.3 Students' Participation in Activities Provided by the Community

More students reported using computers in public libraries than in community centres or youth centres

When students were asked to indicate their usage of community IT facilities, more primary school students reported using computers in public libraries (42% of P4 and 37% of P6) than in community centres or youth centres (16% of P4 and 17% of P6) in MS1. A statistically significant decrease was noted in percentages of P6 students using computers in Internet Café (from 13% to 8%) in MS2 and a statistically significant increase in that of P4 students using computers in school or at home only (from 46% to 56%) in MS2 (Table 6.123, [P6]SQ8e).

Table 6.123 Locations that student used computers other than at their own school and at home ([P6]SQ8e)

Locations	Percentage (%) of Students choosing the options					
	P4			P6		
	MS1 (N=1787)	MS2 (N=1940)	*P*-value	MS1 (N=1949)	MS2 (N=2047)	*P*-value
Others' home (e.g. fellow students/friends/relatives)	42	43	0.907	51	53	0.332
Other schools	4	4	0.665	3	3	0.638
Community centres/Youth centres	16	17	0.373	17	17	0.563
Public libraries	42	41	0.764	37	39	0.177
Internet Café	8	7	0.385	13	8	0.000 ***
Others	16	12	0.001*	14	12	0.225
Only use the computers in school/at home	46	56	0.000***	49	51	0.331

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to be satisfied with the technical and learning support from the community except P6 students who perceived a lower level of satisfaction with the technical support from the community

As for the technical support, 45% of P4 and 36% of P6 students were satisfied or very satisfied with the technical support from the community in MS1 (Table 6.124, [P6]SQ9b.iii). Among those students who received learning support from others during the learning process, 48% of P4 and 41% of P6 students reported that they found the learning support from the community to be satisfied or very satisfied (Table 6.124, [P6]SQ15c.iii). A statistically significant increase was observed in the level of satisfaction of P4 students with the technical support (from 45% to 48%) and learning support (from 48% to 54%) from the community in MS2.

Table 6.124 Students' levels of satisfaction with the technical support and learning support from the community ([P6]SQ9b.iii, 15c.iii)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the technical support from the community															
P4	MS1	3.37	1.16	1781	340	(19)	470	(26)	669	(38)	125	(7)	178	(10)	0.032*
	MS2	3.46	1.12	1951	398	(20)	548	(28)	708	(36)	153	(8)	143	(7)	
P6	MS1	3.20	1.07	1946	220	(11)	494	(25)	872	(45)	177	(9)	184	(9)	0.184
	MS2	3.24	1.05	2056	248	(12)	524	(25)	937	(46)	174	(8)	174	(8)	
Levels of satisfaction with the learning support from the community															
P4	MS1	3.51	1.14	1139	276	(24)	272	(24)	427	(38)	83	(7)	80	(7)	0.038*
	MS2	3.58	1.15	1242	323	(26)	342	(28)	395	(32)	100	(8)	82	(7)	
P6	MS1	3.31	1.09	1209	188	(16)	299	(25)	521	(43)	99	(8)	102	(8)	0.620
	MS2	3.34	1.01	1300	184	(14)	333	(26)	608	(47)	96	(7)	79	(6)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.7.3 Digital Divide

School heads tended to be satisfied with their schools setting up concrete programmes to minimize the effect of digital divide

Regarding the concrete programmes that schools set up to minimize the effect of digital divide, 38% of school heads were satisfied or very satisfied with this aspect in MS1. No statistically significant difference was found in MS2 (Table 6.125, [P1]HSQ7b).

Table 6.125 School heads' levels of satisfaction with their schools setting up concrete programmes to minimize the effect of digital divide ([P1]HSQ7b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school sets up concrete programme(s) to minimize the effect of digital divide (數碼隔閡)."									
MS1	3.32	0.67	551	13 (2)	199 (36)	293 (53)	44 (8)	2 (0)	0.195
MS2	3.38	0.63	445	9 (2)	177 (40)	232 (52)	27 (6)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Home computers were quite widely available to primary school students, but Internet access was not extensively available to all the low income group families having monthly income below $10,000

A wide range of measures have been taken by the EMB to eliminate the 'digital divide'. In MS1, 85% of the low income group families which had a monthly income below $10,000 had personal computers at home. 76% of them had Internet access at home. 90% of them had broadband whereas 10% had dialup connection at home. The difference in the proportions of Internet access was statistically significant among the three income groups [$\chi^2_{(df=2)} = 192.99$, $p < 0.001$]. In MS2, 88% of the low income group families had personal computers at home. 81% of them had Internet access at home. 88% of them had broadband whereas 12% had dialup connection at home. The difference in the proportions of Internet access was also statistically significant among the three income groups [$\chi^2_{(df=2)} = 167.55$, $p < 0.001$] (Table 6.126, [P7]PQ11,12a,b,25). These figures suggested that home computers were quite widely available for primary school students in the low income group. However, it was noteworthy that Internet access was not extensively available to all of them.

Table 6.126 Families with personal computer, Internet access at home and mode of Internet connection by monthly family income ([P7]PQ11,12a,b,25)

IT facilities at home	Percentage (%) of families in primary schools											
	MS1						MS2					
	Total Monthly income of the family per month				Association between digital divide and income		Total Monthly income of the family per month				Association between digital divide and income	
	Below $10,000 (N=1141)#	$10,000-30,000 (N=1336)#	Above $30,000 (N=503)#	Overall (N=2980)#	$\chi^2_{(df=2)}$	*P*-value	Below $10,000 (N=1260)#	$10,000-30,000 (N=1648)#	Above $30,000 (N=498)#	Overall (N=3408)#	$\chi^2_{(df=2)}$	*P*-value
Personal Computer (s)	85	96	99	92	150.59	0.000***	88	97	99	94	131.64	0.000***
Internet access	76	92	97	87	192.99	0.000***	81	94	98	90	167.55	0.000***
Mode of Internet	(N=868)#	(N=1232)#	(N=488)#	(N=2588)#			(N=1002)#	(N=1522)#	(N=478)#	(N=3002)#		
-Broadband	90	92	94	92	6.96	0.03	88	93	96	92	22.81	0.000***
-Dial up	10	8	6	8			12	7	4	8		

Number of response refers to valid cases related to corresponding computing. Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

Almost all schools opened computer rooms for students' use after school

Under the Second ITEd Strategy, computer recycling and donation in collaboration with the Parent-Teacher Associations or other parties to help needy students have been promoted in schools. Incentive grant for extending the opening hours of school computer facilities has been continually provided to help students with easy access to computers after school. In this regard, the extent of schools' attempt to take measures to address the digital divide issues is investigated. School heads were asked about the measures carried out to help needy students in using IT in their learning after school (Table 6.127, ([P2]HQ10a-e). In MS1, almost all primary school heads (94%) indicated that they had opened computer rooms for students' use after school. Only one quarter of the schools indicated that students had applied for computers from related organisations in MS1, but the percentage significantly increased to 55% in MS2. 15% of the schools had called for donation or recycled computers from parents or students in MS1, but the percentage significantly increased to 27% in MS2. As reported in Section 6.5.1.4, 43% and 32% of P4 and P6 students respectively considered the opening hours of computer rooms beyond school hours to be sufficient or very sufficient in MS1. A statistically significant increase was reported in P6 students' perceived level of sufficiency (from 32% to 35%) (Table 6.92, [P6]SQ7e). The results showed that initial measures in extending the opening hours of school facilities had been significantly implemented by most of the schools, while further measure such as computer recycling had yet to be put forward in MS1 and there was a statistically significant increase in MS2.

Table 6.127 Measures taken to help needy students use IT in their learning after school in 2004/05 and 2005/06 school years ([P2]HQ10a-e)

Measures taken to help needy students use IT in their learning after school	Percentage (%)		*P*-value
	MS1 (N=537)	MS2 (N=435)	
a. Computer room(s) was/were opened for students' use after school	94	95	0.215
d. Students applied for computers (including recycled computers) from related organisations [e.g. non-government organisations (NGOs) and IT industries]	25	55	0.000***
e. Call for donation of/recycled computers from students/parents	15	27	0.000***
b. Portable computers were loaned to poor/needy students for use at home	4	6	0.175
c. Arranged students to buy computer equipment by installments	4	4	0.477

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

6.8 Summary of Discussion

6.8.1 Strategic Goal 1 Empowering Learners with IT

Proficiency in Computing Skills: The promotion of ITEd in schools produced positive outcomes on students' learning in terms of mastery of IT skills to use software and hardware. Students could master requisite IT knowledge and apply basic concepts and skills at their related learning stages. In MS1, majority of the students indicated that they were proficient or highly proficient in using software and hardware such as "online information searching tools" (52% of P4 and 68% of P6), "online communication software" (54% of P4 and 70% of P6), "keyboard" (58% of P4 and 71% of P6) and "printer" (48% of P4 and 60% of P6). Lower percentages of the students perceived themselves as proficient or highly proficient in using "audio or video editing software" (37% of P4 and 40% of P6), "programming" (37% for both P4 and P6), "scanner" (36% of P4 and 42% of P6) and "mobile devices" (34% of P4 and 40% of P6). A statistically significant increase was observed in MS2 in the percentages of both P4 and P6 students who rated themselves as proficient or highly proficient in using "online information searching tools" (MS1: 52%-68%; MS2: 56%-72%) and the "keyboard" (MS1: 58%-71%; MS2: 63%-75%). A statistically significant increase was also observed in P6 students' proficiency level of using "presentation software" (from 64% to 69%), "digital camera" (from 53% to 58%) and "digital video recorder" (from 47% to 51%) as well as that of P4 students in "online communication software" (from 54% to 57%) in MS2. However, a statistically significant decrease was reported in MS2 in P4 students' proficiency level of "Chinese input" (from 41% to 37%) and that of the P6 students in using "web design or editing software" (from 44% to 42%).

Attitude towards Social and Ethical Issues of Using IT: Students generally showed awareness of the social and ethical issues in using IT. Primary school students showed greater concern about the issue of e-mail bombs or the spread of computer virus. [A statistically significant increase was noted in the percentages of students who agreed or strongly agreed to "beware of e-mail bombs or the spread of computer virus" in MS2 (MS1: 61%-65%; MS2: 69%-73%).] They were less concerned about the issue of "sending or forwarding unnecessary e-mails or messages". [40% of the students agreed or strongly agreed to this item in MS1 and a statistically significant increase was noted in the P4 students' level of agreement to this item (from 40% to 48%) in MS2.]

Belief and Attitude towards Use of IT for Learning: Most students showed very positive attitude towards the use of IT for learning. Students liked to use computers for learning. 84% to 89% of primary school students liked to use computers for learning in class or beyond school hours in MS1. A statistically significant increase was noted in the percentages of P4 (from 89% to 90%) and P6 (from 86% to 87%) students who liked using computers for learning in class in MS2. No significance difference was noted for in the percentage of students who liked using computers beyond school hours in MS2.

Learning Activities with IT: Students spent more time on computers at home or in other places than in schools. According to MS1, at least 40% of the primary school students spent two hours or more per day on using the computers at home or other places while only about 20% of them did so at school during the week prior to the conduct of the questionnaire survey. The average number of hours that P6 students used computers per day in school, at home or in other places significantly decreased statistically in MS2.

With respect to the learning activities with IT, students were given the opportunities to use computers in class other than Computer or IT lessons. In MS1, around two-thirds of students reported that computers were used for learning and teaching 1 to 10 times in class apart from Computer or IT lessons during the week prior to the conduct of the questionnaire survey. A

statistically significant difference was found in the frequency of P4 students using computers for learning in class (from 4% to 6% of P4 students reported using computers 21 to 30 times and from 65% to 67% of P4 students using computers 1 to 10 times) whereas there was no statistically significant difference for P6 students in MS2. Computers were used the most frequently in language subjects. A statistically significant increase was noted in the percentages of students who chose "English Language" (MS1: 12%-18%; MS2: 15%-20%) and "General Studies" (MS1: 13%-19%; MS2: 16%-21%) in MS2 whereas a statistically significant decrease was noted in the percentages of students choosing "Chinese Language" (MS1: 25%-28%; MS2: 20%-21%) in MS2.

Primary school students engaged in different types of learning activities with the use of IT. Learning activities in school with the use of IT were mainly confined to information search. In MS1, 39% of P4 and 54% of P6 students frequently or very frequently used computers for "information search". A relatively small proportion of the students (26% of P4 and 33% of P6) reported using IT for "information collation and analysis" frequently or very frequently. No statistically significant difference was noted in MS2.

With respect to the learning activities beyond school hours with the use of digital resources, around half of the students used digital resources beyond school hours, no matter if the resources were assigned by their teacher for learning subject knowledge or taken on their own initiative for self-learning. A statistically significant decrease was noted in the percentages of P6 students reported using digital resources assigned by teachers (from 60% to 54%) beyond school hours and for both P4 and P6 students who used digital resources on their own initiative for self-learning beyond school hours (MS1: 55%-59%; MS2: 49%-52%) in MS2.

Confidence in the Use of IT to Perform Learning Tasks: Students were generally confident in using IT for learning, especially in information search. In terms of the perceived levels of confidence in using IT to perform different learning tasks, 64% of P4 and 74% of P6 students in MS1 rated themselves as confident or very confident in "information search". Around 50% of the students in MS1 rated themselves as confident or very confident in "self-evaluation on learning outcomes" (57% of P4 and 58% of P6), "information selection" (51% of P4 and 56% of P6), "reporting and presentation" (48% of P4 and 57% of P6) as well as "information collation and analysis" (47% of P4 and 56% of P6). No statistically significant difference was noted in MS2.

As for the confidence level in the use of IT to perform respective computing tasks, higher proportions of students in MS1 rated themselves as confident or very confident in "English input via the computer" (66% of P4 and 70% of P6). Slightly less than half of them in MS1 (48% of P4 and 49% of P6) rated themselves as confident or very confident in "using e-learning platforms to conduct learning activities". A statistically significant decrease was found in the percentage of P4 students who rated themselves as confident or very confident in "Chinese input" (from 53% to 50%) in MS2 whereas a statistically significant increase was observed in "English input" (from 66% to 68%) for P4 students in MS2.

Learning Support: Students tended to perceive the support from teachers to be sufficient when they encountered difficulties in performing the learning activities with the use of IT, whereas teachers indicated that they occasionally provided learning support for the students. A statistically significant increase was noted in the frequency level that teachers provided such support (from 25% to 28%) in MS2. There was also a statistically significant increase for students receiving such support (from 43% to 47%) in MS2. Regarding the sufficiency of learning support provided by teachers, a statistically significant increase was observed in the percentages of students (MS1: 55%-59%; MS2: 60%-64%) rating such support as sufficient or very sufficient in MS2.

School ITEd Curriculum: Concerning the opportunities given to students' use of IT in learning, school heads tended to be very satisfied that students were given the opportunities to learn about IT knowledge and skills. Nearly all primary schools (99%) offered Computer or IT subjects in both MS1 and MS2. Schools followed closely the guidelines of Information Technology Learning Targets in school IT curriculum. Basic hardware operation skills were taught in lower class levels. Skills in using software for communication, word processing, presentation and web design were then developed in upper class levels. Information searching skill, sense of intellectual property and personal data privacy awareness as well as proper use of IT were fostered since P3. A statistically significant increase was noted in teaching the contents of the correct attitude towards using IT at lower class levels.

6.8.2 Strategic Goal 2 Empowering Teachers with IT

Teachers' IT competency: Primary school heads were satisfied with teachers' IT competency. In general, primary school teachers were proficient in using basic software and hardware. Teachers were more proficient in using "word processing software", "online communication software", "online information searching tools" and in using standard input, output and storage devices in daily work such as "printer", "keyboard", "CD-ROM writer" and "digital camera". However, they were less proficient in using "multi-media design software", "audio or video editing software", "programming" as well as using hardware mobile agents such as "mobile devices" and "portable multi-media player devices". When the data was compared between MS1 and MS2, there was a tendency that teachers were picking up on the use of advance multi-media software such as "multi-media design software", "audio or video editing software" and "programming" as well as hardware mobile agents such as "digital video recorder", "mobile devices", "network devices" and "portable multi-media player devices" for edutainment.

Belief and Attitude towards Using IT for Learning and Teaching: Regarding the teachers' ITEd perception, teachers possessed positive attitude towards the impact of IT on learning and teaching. Teachers perceived a higher level of agreement that the use of IT could enhance teaching effectiveness, but they perceived a lower level of agreement that it could strengthen the relationship between teachers and students. With respect to their roles when applying IT in the learning, teaching and assessment processes, teachers perceived a higher level of agreement that they used IT to motivate students in the learning of KLAs as well as provided opportunities for students to acquire IT knowledge and skills, but they perceived a lower level of agreement that they used IT for monitoring and assessment of students' performance and learning progress. A statistically significant increase in teachers' levels of agreement to other benefits of using IT was observed in MS2. Such benefits included "it saves time and is convenient to use IT", "the use of IT can provide immediate feedback to students in their learning" and "the use of IT facilitates effective planning and management of teaching process". Although a statistically significant increase was noted in the teachers' levels of agreement to the above-mentioned benefits of using IT, their willingness to allocate more time to apply IT in teaching remained unchanged over the periods of MS1 and MS2. Teachers tended to be willing to allocate more time to apply IT in teaching.

Teaching with IT: With regard to the application of IT, school heads were satisfied with teachers' use of IT in daily teaching and learning management as well as in cross-subject learning activities. The two subjects which computers were used more frequently were English Language and General Studies. The frequency of using computers in class by teachers increased. Fewer teachers (from 57% to 45%) used computers in class 1 to 10 times during the week prior to the conduct of the questionnaire survey in MS2, but more teachers (from 36% to 51%) used computers in class

11 times or more in MS2. As for the mode of computer usage, primary school teachers mainly used computers for explanation and demonstration to the whole class to support students in learning subject knowledge. Teachers tended to conduct teaching by having students working individually with computers occasionally and they seldom had students working in groups with computers. Although there was a statistically significant increase in the frequency of teachers using IT to conduct teaching, teachers only occasionally used IT to design learning context to foster students' higher-order thinking capability and they tended to use IT to arrange small-group learning occasionally.

As for the use of digital resources, two-thirds of the primary school teachers assigned digital resources to students for learning subject knowledge beyond school hours. Among them, 70% of them assigned digital resources 1 to 4 times beyond school hours during the week prior to the conduct of the questionnaire survey. Although a statistically significant increase was noted in the frequency of teachers using all the listed electronic means for assessing or responding to students' learning situation in MS2, they rarely used the listed electronic means for these purposes.

Confidence in Using IT for Learning and Teaching: Concerning the confidence in using IT for learning and teaching, teachers tended to consider themselves as capable of integrating IT into teaching. Teachers perceived a higher level of confidence in selecting appropriate digital resources to conduct teaching but they perceived a lower level of confidence in building a 'student-centred' learning environment with the use of digital resources and arranging small-group learning. A statistically significant increase was noted in the confidence level of teachers in conducting higher level teaching activities such as nurturing students' capability in processing information (from 52% to 55%), designing learning context to foster students' higher-order thinking capability (from 41% to 44%), arranging small-group learning (from 33% to 37%) and building a 'student-centred' learning environment with the use of digital resources (from 29% to 33%) in MS2. Teachers perceived a higher level of agreement that their teaching could promote students' capability in information search, but they perceived a lower level of agreement that their teaching could promote students' capability in information collation and analysis as well as self-evaluation on learning outcomes. A statistically significant increase was noted in teachers' perceived level of agreement on their teaching in relation to promoting students' capability in performing all listed learning activities in MS2.

School Professional Development in ITEd for Teachers: Nearly half of the primary school teachers had participated in the professional development activities and over half of them showed their willingness for future participation in ITEd professional development in MS1. A statistically significant decrease of the actual participation and willingness for future participation in these programmes was observed in MS2. Teachers tended to find the ITEd professional development programmes to be practical and they found that these programmes were only quite sufficient (一般). Regarding their expectation of the themes and modes of professional development programmes or activities, the top three commonly selected themes were "using new technology in teaching", "IT application on subject or cross-curricular teaching" and "IT application on project-based or cross-curricular learning" and the top two commonly selected modes were "training courses" and "workshops". A statistically significant decrease was noted in the percentages of teachers choosing the aforementioned themes and modes in MS2.

School ITEd Sharing and Collaboration among Teachers: With respect to the promotion of ITEd, primary school teachers tended to agree that they would share their teaching experience in using IT or teaching materials with colleagues and the others, but they perceived themselves having a lower level of capability to share their experience in promoting ITEd with the education community. A statistically significant increase was noted in their perceived level of capability to share their experience in promoting ITEd with the education community (from 15% to 20% of them rated capable or very capable to do so) in MS2.

Areas for Improvement of ITEd Development: Regarding the areas for improvement of ITEd development, primary school teachers indicated that teaching workload should be reduced and the design of general classrooms should be modified to suit the use of IT in teaching. A statistically significant decrease was spotted in MS2 for the area of "the design of general classrooms is unsuitable for the use of IT in teaching" (from 46% to 42%). The top three areas for improvement of ITEd development in Hong Kong were teachers' workload reduction, increase in IT experts or professionals in schools and the provision of digital resources for learning purposes. A statistically significant decrease was observed in all listed improvement areas for ITEd development in Hong Kong in MS2.

6.8.3 Strategic Goal 3 Enhancing School Leadership for the Knowledge Age

School ITEd Plan: School heads and their associates were guided to establish visions and goals as well as to build teams appropriate for their school contexts in integrating IT into school planning, curricula as well as learning and teaching processes. School heads perceived the highest level of satisfaction with the school ITEd plans covering the infrastructure requirements of schools. No statistically significant difference was noted in school heads' satisfaction level with the aspects related to the school ITEd plans except "clear vision and goal(s) are stated in the school ITEd plan" (from 82% to 79%) and "the school ITEd plan covers the infrastructure requirements of the school" (from 81% to 77%) in MS2.

When formulating the school ITEd plans for the 2005/06 and 2006/07 school years, school heads ranked improving students' use of IT in their learning as the top priority. This was followed by improving digital resources and the IT infrastructure in schools and strengthening teachers' professional development on ITEd knowledge and its application. A statistically significant decrease in percentage was observed in the percentage of school heads choosing the priority of improving digital resources and the IT infrastructure in school (from 57% to 50%) in MS2.

ITEd Team teachers participated in many tasks for the promotion of school ITEd. ITEd Team teachers tended to have considerable participation in encouraging teachers to make appropriate use of IT in teaching, but they tended to have some participation in exchanging experience and insight on the use of IT in teaching with other schools/regions/countries when implementing school ITEd plans. In MS1, they rated themselves as having considerable or strong participation in the tasks of encouraging other teachers to make appropriate use of IT in teaching (51%), formulating the school-based ITEd plan (50%) and providing ITEd technical support for teachers (49%). No statistically significant difference was noted in MS2 in all the tasks that ITEd Team teachers participated when implementing school ITEd plans.

Concerning the difficulties of implementing ITEd plans, teachers' heavy workload (MS1: 48%; MS2: 38%) and lack of suitable educational software or digital resources (MS1: 32%; MS2: 26%) were rated as the main hurdles which were often or most often encountered by school heads. Insufficient computer rooms and IT facilities were also other difficulties indicated by 32% and 29% of school heads respectively in MS1. A statistically significant decrease was observed in all difficulties in MS2 except the difficulty of "the time which teachers need to prepare teaching materials with IT or participate in related ITEd professional development activities affects their teaching", "the current teachers' professional development programs cannot foster/develop the requisite IT skills for teachers", "the school is in lack of concrete plan to encourage teachers to promote ITEd" and "insufficient technical support in school".

Activities to Promote IT Culture: School heads were satisfied with the collaborative team work and sharing among teachers in the use of IT for teaching in schools. In MS1, slightly more than a quarter of schools (28%) organised sharing activities on the use of IT for teaching. Among them, 54% of schools organised these activities with outside parties. Of these, 44% of them organised the activities with local schools. No statistically significant difference was identified in this area in MS2.

Resources and Support: The measure of merging the various IT grants and providing flexibility on the use of grants effectively enhanced schools' flexibility to allocate resources to support school-based ITEd plans and accountability for results. With respect to making appropriate use of resources, around half of the primary schools received funding from the Quality Education Fund for IT-related projects in both MS1 and MS2. Moreover, school heads tended to be satisfied with the current funding model of the "Composite Information Technology Grant" and ITEd Team Teachers were quite satisfied (一般) with this model (47% of school heads and 32% of the ITEd Team teachers were satisfied or very satisfied with this funding model in MS1). No statistically significant difference was identified in the satisfaction levels of school heads in MS2, but a statistically significant decrease (from 32% to 22%) was spotted in MS2 for the satisfaction levels of the ITEd Team teachers.

School Professional Development in ITEd for School Heads: The measure to enhance school leadership by providing training on e-leadership and application of ITEd in professional development programmes for school heads was implemented. In MS1, around two-fifths of school heads participated in ITEd professional development programmes or activities. Among them, 72% of school heads found the programmes or activities to be effective or very effective in helping their teaching, administration and managerial work. No statistically significant difference in this area was identified in MS2. According to the surveyed school heads in MS1, the three most popular themes which should be included into ITEd professional development programmes or activities were using IT in school administration or managerial work (71%), formulation of school-based ITEd plans (58%) and using new technology in teaching (50%). They would like the future programmes or activities to be conducted in the modes of training courses (76%) and workshops (70%). No statistically significant difference was identified in school heads' expectations of the themes and modes of ITEd professional development programmes or activities in MS2.

School Heads' Willingness to Promote ITEd: In MS1, majority of school heads (86%) were willing or very willing to allocate more time for the promotion of ITEd in schools. No statistically significant difference was identified in MS2.

6.8.4 Strategic Goal 4 Enriching Digital Resources for Learning

School Heads' Perception of Enriching Digital Resources for Learning: In MS1, 68% of school heads were satisfied or very satisfied with the acquisition of up-to-date digital resources for teachers' and students' use. 53% of them were satisfied or very satisfied that their schools developed quality school-based digital resources and a repository of online resources for all KLAs. 47% of them were satisfied or very satisfied that their schools derived an effective digital resource management mechanism to facilitate learning and teaching as well as sharing among teachers, parents and students. A statistically significant increase was observed in school heads' level of satisfaction with all the aspects related to enriching digital resources for learning in MS2 (MS1: 47%-68%; MS2: 59%-74%).

Sources of Digital Resources: In MS1, school heads considered the digital resources from the HKEdCity as the most important source for learning and teaching (89% of school heads rated this as important or very important). In MS2, a statistically significant increase was noted in school heads' perceived level of importance in digital resources purchased by means of the electronic Learning Credits (from 70% to 80% rated this as important or very important). The most common digital resources which teachers used frequently or very frequently were those provided by textbook publishers. A statistically significant increase in the usage of digital resources provided by textbook publishers (from 61% to 70%) was identified in MS2. Usage of all other digital resources such as those from the HKEdCity (from 28% to 31%), the EMB (from 17% to 20%) and the community (MS1:8%-10%; MS2: 10%-14%) significantly increased statistically in MS2.

Students perceived that the digital resources were helpful for their learning; no matter they were assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours whereas teachers perceived a lower level of helpfulness of digital resources assigned by them for students' subject learning. In MS1, more than 60% of the teachers (62%) and students (61%-68%) found these digital resources to be helpful or definitely helpful for students' learning. A statistically significant increase was noted in teachers' perceived level of the helpfulness of digital resources assigned by teachers for students' learning of subject knowledge beyond school hour (from 62% to 66%) and in students' perceived level of the helpfulness of digital resources used on students' initiative for self-learning beyond school hours in MS2 (MS1: 63%-68%; MS2: 68%-74%).

Students tended to consider digital resources in schools as sufficient whereas teachers considered them as quite sufficient (一般). In MS1, 41% of the teachers, 53% of P4 and 42% of P6 students perceived the provision of digital resources in schools as sufficient or very sufficient to meet students' needs. A statistically significant increase was identified in P6 students' (from 42% to 47%) and teachers' perceived level (from 41% to 49%) of the sufficiency of digital resources in schools in MS2.

Lack of suitable digital resources was one of the major problems that schools encountered when implementing school ITEd plans as perceived by school heads. As reported by the ITEd Team teachers in MS1, the second greatest support needed by the primary schools was increasing or upgrading digital resources. 70% of them indicated that they were quite in need or much in need of this support. There was no statistically significant difference between MS1 and MS2 in this area.

Digital Resources Repository: Around one-third of the surveyed primary school teachers and more than half of the students used the e-learning platforms for teaching or learning. A statistically significant decrease was noted in the percentage of P6 students using e-learning platforms for learning in MS2 (from 55% to 49%). Amongst those who had used school e-learning platforms, 73% to 80% of the students and 73% of the teachers visited the platforms 1 to 10 times during the week prior to the conduct of the questionnaire survey in MS1. A statistically significant increase was noted in the frequency of usage for teachers while a statistically significant decrease was noted for students in MS2. Regarding the learning effectiveness of e-learning platforms, students perceived a higher level of agreement on the helpfulness of e-learning platforms to their learning than that of teachers. 39% of the teachers, 66% of P4 and 58% of P6 students agreed or strongly agreed that e-learning platforms could help students' learning in MS1. No statistically significant difference was observed in MS2.

As for the usage of the HKEdCity, over half of the students and 73% of the teachers visited the HKEdCity in MS1 and students' usage of the HKEdCity significantly increased statistically in MS2. Regarding the learning effectiveness of the HKEdCity, teachers, students and parents tended

to perceive the HKEdCity to be effective in assisting students' learning (55% of the primary school teachers, 59% of P4 and 49% of P6 students as well as 40% of parents considered the HKEdCity as effective or very effective in MS1). Teachers and students tended to perceive that the learning materials provided by the HKEdCity were suitable for students [around half of the teachers (53%) and students (58% of P4 and 47% of P6) considered the learning materials as suitable or very suitable in MS1]. There was no statistically significant difference in these two aspects of the HKEdCity in MS2.

6.8.5 Strategic Goal 5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

Access and Connectivity in Schools: School heads were satisfied that their schools provided sound and sufficient IT facilities for students and teachers. Hardware was greatly improved in primary schools. The number of computers and digital projectors in classrooms significantly increased statistically. On average, there were 105.37 desktop and 12.11 notebook computers respectively per primary school in MS1. The average number of desktop computers per school significantly increased statistically (from 105.37 to 115.23) in MS2. The majority of computers in primary schools were located in special rooms. They were still not available in every classroom in primary schools. An average of 17.74 computers including desktop and notebook located in an average of 20.40 general classrooms per primary school was found in MS1. The number of computers allocated to an average of 21.50 general classrooms had significantly increased statistically to an average of 20.01 computers per primary school in MS2. In MS1, the average student-to-computer gross ratio (including all computers in school), student-to-computer net ratio (excluding computers in staff rooms and general office) and teacher-to-computer ratio (computers in staff rooms) were 5.95:1, 6.77:1 and 5.90:1 respectively in MS1 while they were 5.70:1, 6.53:1 and 2.87:1 respectively in MS2. The teacher-computer ratio was significantly improved statistically to three teachers per computer in MS2.

With respect to the provision of digital projectors, the average number of digital projectors for mobile use and that for fixed installation were 2.25 and 19.80 respectively in MS1. A statistically significant increase from an average of 14.68 digital projectors installed in 21.50 general classrooms in MS1 to 17.46 digital projectors was noted in MS2. As regards the provision of wireless technology, a statistically significant increase was noted in the percentage of the primary schools reported having at least 1 wireless LAN in schools (from 56% to 73%) in MS2.

As for the adequacy of IT facilities in schools, students perceived a higher level of sufficiency than that of teachers on school IT facilities to meet students' needs (40% of the teachers, 63% of P4 and 53% of P6 students considered the IT facilities as sufficient or very sufficient in MS1). A statistically significant increase was identified in P6 students' (from 53% to 60%) and teachers' (from 40% to 49%) perceived level of sufficiency to meet students' needs in MS2. With regard to the teaching needs, teachers perceived the IT facilities in schools as quite sufficient (一般) in MS1. A statistically significant increase was identified in teachers' perceived level of sufficiency to meet their needs (from 37% to 47%) in MS2.

The School ITEd Survey showed that all primary schools had connection to the Internet through broadband in MS1 and MS2. A statistically significant increase was identified in the percentage of schools having a connection speed of 10Mbps or higher (from 62% to 64%) in MS2. In MS1, nearly all primary schools (98%) had school websites. A statistically significant increase in the percentage of schools having school intranet (from 73% to 82%) and e-learning platforms (from 61% to 76%) was noted in MS2. As for the adequacy of the Internet connection in schools, P4 students and teachers tended to be satisfied with the speed of Internet connection in schools while

P6 students in MS1 were quite satisfied (一般) with it (51% of the teachers, 54% of P4 and 40% of P6 students were satisfied or very satisfied). There was a statistically significant increase in teachers' (from 51% to 54%) and students' (MS1: 40%-54%; MS2: 46%-60%) perceived level of satisfaction in this aspect in MS2.

Nearly all primary schools had opened computer rooms for students after school. Students considered the opening hours of computer rooms beyond school hours as quite sufficient (一般) (43% of P4 and 32% of P6 students considered this service as sufficient or very sufficient in MS1). A statistically significant increase was observed in P6 students' perceived level of sufficiency in this aspect (from 32% to 35%) in MS2.

Management and Maintenance of IT Facilities and Technical Support Services: Regarding technical support services, students tended to perceive that it was easy to get support when encountering technical problems in using computers (41% of P4 and 42% of P6 considered that it was easy or very easy to get such support in MS1). A statistically significant increase was noted in P6 students' perceived level of easiness in getting such support (from 42% to 46%) in MS2. With regard to the channels from which the teachers could seek technical support, teachers considered that the technical support provided by IT technicians in schools was the most satisfactory channel. 72% of the primary school teachers in MS1 reported the technical support from IT technicians in schools as satisfied or very satisfied. A statistically significant increase was noted in teachers' perceived level of satisfaction with the technical support from school-based technical support service providers (from 37% to 42%) and from other technical support service providers (from 30% to 37%) in MS2.

Upgrading IT Facilities and Exploring Advanced IT Technology: With regard to the upgrading of IT facilities, students and teachers tended to perceive that IT infrastructure was sufficient to meet their needs. A statistically significant increase was noted in students' (MS1: 51%-59%; and MS2: 59%-66% considered such infrastructure as sufficient or very sufficient) and teachers' (from 43% to 48% rated it as sufficient or very sufficient) perceived sufficiency level of the IT infrastructure in MS2. School heads were concerned about both conventional technologies and the advanced ones. In MS1, they indicated that IT infrastructure should be further consolidated by upgrading IT facilities. Computers and projectors in classrooms (58%), multi-media computer rooms (53%) and e-learning platforms (53%) were the three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in primary schools. There was a statistically significant increase in the need of upgrading "interactive electronic whiteboard" (from 10% to 25%) and "digital tools" (from 11% to 20%) in MS2 and a statistically significant decrease in the need of upgrading "wireless network" (from 35% to 25%) and "e-learning platform" (from 53% to 45%) in MS2.

Teachers tended to perceive the advanced IT facilities such as wireless network system in schools as sufficient to promote innovative teaching pedagogy. A statistically significant increase was noted in teachers' perceived sufficiency level of such IT facilities (from 43% to 47% rated these facilities as sufficient or very sufficient) in MS2. School heads perceived e-learning platforms (47%), computers and projectors in classrooms (46%) and mobile learning devices (41%) as the top three priorities for additional IT facilities or services which were needed for students' and teachers' use in primary schools in MS1. A statistically significant increase was noted in the percentage of school heads choosing the priority of "interactive electronic whiteboard" (from 24% to 40%), "mobile learning devices" (from 41% to 49%) and "digital tools" (from 11% to 17%) for additional IT facilities or services which were needed for students and teachers and a statistically significant decrease in the priority of "e-learning platform" (from 47% to 36%), "multi-media computer rooms" (from 40% to 30%) and "wireless network" (from 35% to 26%) being the additional IT facilities or services that were the most needed for students' and teachers' use in MS2.

6.8.6 Strategic Goal 6 Providing Continuous Research and Development

School Heads' Perception of Continuous Research and Development in ITEd: In MS1, 28% of school heads were satisfied or very satisfied that their schools actively studied or evaluated the effectiveness of some innovative IT pedagogical strategies and shared the experience with the education community. 39% of them were satisfied or very satisfied with their schools' active participation in pilot projects or pilot schemes on teaching so as to explore the effectiveness of the innovative use of IT for learning and teaching enhancement. A quarter (25%) of them were satisfied or very satisfied that the EMB could share the results of these projects with schools in order to assist them in the promotion of ITEd. A statistically significant increase was identified in the above three mentioned listed outcomes (MS1: 25%-39%; MS2: 32%-45%) in MS2.

School ITEd Innovation: 23% of the primary schools had launched pilot schemes or projects on the use of IT for teaching in the 2004/05 school year in MS1. Of the projects which the schools had joined with other organisations, 50% of schools collaborated with local tertiary institutions, 46% with local community or commercial organisations and 40% with the EMB. A statistically significant decrease in the percentage of schools collaborating with local community or commercial organisations (from 46% to 19%) was identified in MS2. When implementing school ITEd plans, ITEd Team teachers perceived that they had some participation in exploring new technology as well as researching and evaluating the effectiveness of ITEd in schools. 36% of the ITEd Team teachers in MS1 perceived that they had considerable or strong participation in exploring new technology such as wireless system and developing innovative teaching methods in MS1. 35% of them perceived that they had considerable or strong participation in performing research and evaluation on the effectiveness of ITEd in schools. No statistically significant difference was identified in these two areas in MS2.

Regarding the usefulness of the support and resources from EMB in developing teachers' ability in using IT for teaching, such as sharing the results of research-based projects with schools, teachers generally expressed a neutral attitude towards this aspect (24% in both MS1 and MS2 agreed or strongly agreed to this statement).

6.8.7 Strategic Goal 7 Promoting Community–wide Support and Community Building

Home-school Co-operation and Parents' Involvement: School heads tended to be satisfied with their schools setting up concrete programmes to encourage parents' involvement in ITEd. A statistically significant increase was observed in this aspect (from 38% to 46%) in MS2. Primary schools or the Parent-Teacher Associations in schools actively organised or carried out different home-school collaboration activities or measures. A statistically significant increase was identified in MS2 in the following measures: encouraging parents to understand situations in school through visiting school websites or intranets (from 87% to 91%), encouraging parents to instill proper principles, values and attitude in the use of IT into their children (from 76% to 86%) and providing ITEd activities for parents (from 70% to 82%). The measure to put in place programmes for schools and the Parent-Teacher Associations to help parents to ensure that their students understood the ethical, legal and health issues involved in using IT was implemented. Parents perceived that these activities were quite sufficient (一般). There was a statistically significant increase in the percentage of parents rating these activities as sufficient or very sufficient (from 26% to 30%) in MS2.

Regarding the home-school communication with e-learning platforms, responses from relevant stakeholders revealed that e-learning platform was still not a common means of communication amongst parents, teachers and schools. 37% of the parents in MS1 agreed or strongly agreed that the schools could effectively use the e-learning platforms to promote their communication with schools and teachers. No statistically significant difference was found in the communication with the use of e-learning platforms in MS2 except the percentages of parent who had heard about e-learning platforms significantly increased statistically from 53% to 56%. 32% of the surveyed primary school teachers in MS1 were willing or very willing to make use of e-learning platforms to communicate with parents. No statistically significant difference was identified in MS2. Nonetheless, 83% of the teachers in MS1 rarely or never used e-learning platforms for this purpose, but the percentage significantly dropped to 72% in MS2.

Parental support was essential for students' learning with IT. 93% and 94% of the parents provided computer facilities at home in MS1 and MS2 respectively. Amongst them, 94% and 95% of the parents indicated having access to the Internet in MS1 and MS2 respectively. Amongst those with Internet access, 92% of them had broadband connection at home in both MS1 and MS2. Students perceived the IT facilities at home as sufficient and they were satisfied with the speed of Internet connection at home. A statistically significant increase was observed in P6 students' perceived level of sufficiency of IT facilities at home (from 74% to 76%) in MS2. In MS1, parents supported their children's learning with the use of IT by allowing their children to read IT-related books (36%), allowing them to attend IT courses (33%), encouraging them to make use of community resources (32%) as well as buying educational software (29%) and IT-related hardware or software (28%) for their children. A statistically significant decrease was noted in the percentage of parents attending IT courses themselves (from 15% to 13%) in MS2.

Community-wide Involvement: Community-school collaboration was still not very common. In MS1, out of the 121 primary schools which launched pilot projects on the use of IT for teaching, around two-fifths of them (41%) had collaborated with other organisations. Amongst them, 50% of these schools collaborated with "local tertiary institutions", followed by "local community or commercial organisations" (46%) and the "EMB" (40%) in the 2004/05 school year. Out of the 145 primary schools which had launched sharing activities on the use of IT for teaching, 54% of them had collaborated with other organisations in the 2004/05 school year. Primary schools most often collaborated with "local primary, secondary and special schools" (44%). No statistically significant difference was found in the percentage of schools organising collaboration activities with other organisations in MS2 except with "local community or commercial organisations" for pilot projects (from 46% to 19%).

Primary school heads perceived that the EMB made significant contributions to school development in ITEd. In MS1, most of the school heads (85%) perceived that the EMB made considerable or significant contributions of the provision of IT facilities and digital resources to school development in ITEd. Around 50% thought that the "Internet service providers" (54%), "software and hardware service providers" (52%) and "IT application system developers" (46%) made considerable or significant contributions. Lower percentages of school heads considered that "tertiary institutions" (31%), "professional education organisations" (23%), "local primary, secondary and special schools" (22%), "other government policy departments or bureau" (9%) and "community organisations or centres" (7%) made considerable or significant contributions to school development in ITEd. No statistically significant difference was found in MS2.

With respect to community resources, the HKEdCity was considered by 61% of the ITEd Team teachers in MS1 as the organisation having provided sufficient or very sufficient IT facilities or resources to schools. A statistically significant decrease was found in ITEd Team teachers' perceived sufficiency level of the IT facilities/resources provided by the HKEdCity to schools (from 61% to 49%) in MS2. In MS1, 26% of school heads and 21% of the ITEd Team teachers

perceived the provision of community IT facilities or resources as sufficient or very sufficient. A statistically significant increase was observed in school heads' sufficiency level in this aspect (from 26% to 31%) in MS2. As for the usage of community IT facilities, more students reported using computers in public libraries than in community centres or youth centres. No statistically significant difference was noted in MS2.

Digital Divide: The problem of digital divide still existed. Although home computers were quite widely available for primary school students in the low income group (families with monthly income less than $10,000), it was noteworthy that Internet access was not widely available to all of them. 76% and 81% of families in the low income group had Internet access at home in MS1 and MS2 respectively. Amongst those with Internet access at home, 10% and 12% of them had dial-up connection in MS1 and MS2 respectively. The relatively low Internet connection speed (when compared to that of home computers of students from other income groups) would hinder the learning efficiency of students in using digital resources from the Internet.

Many measures were implemented to address the digital divide. Primary schools carried out measures to help needy students to use IT in their learning after school. The measure to continually extend the opening hours of school computer facilities to help students in need to access computers after school hours was implemented. In MS1, almost all primary schools (94%) opened computer rooms for students' use after school. The measures to encourage computer recycling and donations to help needy students to bridge the digital divide were also progressively implemented. A statistically significant increase was noted in the percentages of schools having students applied for computers from related organisations (from 25% to 55%) and those calling for donation or recycled computers from parents or students (from 15% to 27%) in MS2.

Chapter 7 Major Findings and Discussion for Secondary School Sector

This chapter reports on the major findings and discussion of Main Study (I) (MS1) and Main Study (II) (MS2) about the progress of different ITEd implementation measures and the application of IT in secondary schools with respect to the seven strategic goals of ITEd as set out in the Second ITEd Strategy (EMB, 2004):

- Empowering learners with IT
- Empowering teachers with IT
- Enhancing school leadership for the knowledge age
- Enriching digital resources for learning
- Improving IT infrastructure and pioneering pedagogy using IT
- Providing continuous research and development
- Promoting community-wide support and community building

A snap-shot of each strategic goal is presented for two intervals, namely MS1 and MS2 respectively. The data are drawn from the self-evaluation on the expected outcomes of the strategic goals by school heads and the questionnaires from different stakeholder groups which portray the current situation and the relevant implementation practices of various strategic goals in secondary schools. ***The major findings are based on the results of MS1 which describe the situation of the implementation in the first stage of ITEd. The differences between the findings of MS1 and MS2 are then observed to track the progress of the implementation of ITEd from 2004/05 to 2006/07. Only items with statistically significant difference in MS2 are mentioned.***

7.1 Empowering Learners with IT

The first strategic goal of the Second ITEd Strategy is "Empowering learners with IT" which aims at fostering students with the necessary skills, knowledge and attitude for learning and problem-solving in the information age. To track the progress of this goal, the following aspects related to students' learning with IT are addressed:

- Proficiency in computing skills
- Attitude towards social and ethical issues of using IT
- Belief and attitude towards use of IT for learning
- Learning activities with IT
- Confidence in the use of IT to perform learning tasks
- Learning support
- School ITEd curriculum

7.1.1 Proficiency in Computing Skills

School heads were satisfied with students' IT knowledge and skills

Learning with IT could not be achieved until students had acquired basic knowledge and skills of IT. In MS1, 77% of school heads were satisfied or very satisfied that students could master requisite IT knowledge and apply basic concepts and skills at their related learning stages. No statistically significant difference was noted in MS2 (Table 7.1, [S1]HSQ1a[12]).

Table 7.1 School heads' levels of satisfaction with students' proficiency in computing skills ([S1]HSQ1a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students can master requisite IT knowledge and apply basic concepts and skills at their related learning stages."									
MS1	3.83	0.56	397	30 (8)	274 (69)	89 (22)	4 (1)	0 (0)	0.327
MS2	3.88	0.54	354	32 (9)	247 (70)	74 (21)	1 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students were generally proficient in software and hardware skills

Students were asked to evaluate their proficiency in using software (Table 7.2, [S6]SQ16a-k). In MS1, higher proportions of the students rated themselves as proficient or highly proficient in "online communication software" (72% of S2, 76% of S4 and 76% of S6) and "online information searching tools" (70% of S2, 74% of S4 and 77% of S6); followed by "presentation software" (63% of S2, 64% of S4 and 57% of S6), "word processing software" (56% of S2, 57% of S4 and 61% of S6) and "Chinese input" (56% of S2, 59% of S4 and 60% of S6). All these skills had mean ratings ranged from 3.54 to 3.99 (SD:0.84-1.13) on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'. Lower percentages of the respondents rated themselves as proficient or highly proficient in "audio or video editing software" (33% of S2, 31% of S4 and 23% of S6), "multi-media design software" (32% of S2, 25% of S4 and 16% of S6) and "programming" (28% of S2, 21% of S4 and 14% of S6), with mean ratings below 3.00 on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'.

Among the software listed in Table 7.2, a statistically significant decrease was noted in the percentages of both S2 and S4 students who rated themselves as proficient or highly proficient in using different software while a statistically significant increase was observed in the percentages of S6 students in MS2. For S2 students, a statistically significant decrease was observed in their proficiency level of using "presentation software" (from 63% to 59%), "online communication software" (from 72% to 69%), "computer graphic design" (from 44% to 41%) and "Chinese input" (from 56% to 53%). For S4 students, a statistically significant decrease was observed in their proficiency level of using "spreadsheet" (from 44% to 42%), "presentation software" (from 64% to 57%), "online communication software" (from 76% to 69%) and "online information searching tools" (from 74% to 67%). For S6 students, a statistically significant increase was reported in MS2 in their proficiency level of using "presentation software" (from 57% to 59%), "multi-media design software" (from 16% to 18%) and "audio or video editing software" (from 23% to 27%).

When asked about their proficiency in using hardware (Table 7.3, [S6]SQ17a-j), a higher proportion of the surveyed students in MS1 rated themselves as proficient or highly proficient in the "keyboard" (73% of S2, 74% of S4 and 73% of S6) and "printer" (65% of S2, 65% of S4 and 64% of S6); followed by the use of "digital camera" (55% of S2, 59% of S4 and 59% of S6) and

[12] [S1] refers to questionnaire code; HSQ refers to question item number for specific stakeholder. For details of different questionnaire titles, codes and stakeholders, please refer to Table 4.1 (p.30). Detailed descriptive statistics for secondary school sector for MS1 and MS2 are reported in Appendices 1.2 and 2.2 respectively.

"CD-ROM writer" (55% of S2, 58% of S4 and 58% of S6). All these skills had mean ratings ranged from 3.53 to 4.00 (SD:0.89-1.17) on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'. Around 45% of the surveyed students (43% of S2, 45% of S4 and 43% of S6) indicated that they were proficient or highly proficient in using "scanner". The hardware in which students perceived themselves as the least proficient in using was "mobile devices" (34% of S2, 28% of S4 and 23% of S6 rated themselves as proficient or highly proficient), with mean ratings below 3.00 on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'.

For the hardware shown in Table 7.3, a statistically significant decrease was observed in the percentages of S2 and S4 students who rated themselves as proficient or highly proficient in using "printer" (MS1: 65% for both; MS2: 58%-59%) and "keyboard" (MS1: 73%-74%; MS2: 69%-70%) in MS1. The proficiency level of S2 students in "CD-ROM writer" (from 55% to 52%) also decreased in MS2. For S6 students, a statistically significant increase was also observed in their proficiency level of using all hardware (MS1: 23%-59%; MS2: 29%-64%) except "printer", "CD-ROM writer" and "keyboard" in MS2.

Table 7.2 Students' self-evaluated levels of proficiency in software use ([S6]SQ16a-k)

Class levels	Software	MS1 Mean (1-5)	MS1 SD	MS1 N	MS1 Highly proficient	MS1 Proficient	MS1 Quite proficient (基本)	MS1 Not proficient	MS1 Know nothing at all	MS2 Mean (1-5)	MS2 SD	MS2 N	MS2 Highly proficient	MS2 Proficient	MS2 Quite proficient (基本)	MS2 Not proficient	MS2 Know nothing at all	*P*-value
	a.	3.59	0.93	2263	345 (15)	935 (41)	783 (35)	121 (5)	79 (3)	3.54	0.96	1837	269 (15)	734 (40)	622 (34)	144 (8)	68 (4)	0.062
	b.	3.44	0.95	2263	266 (12)	834 (37)	893 (39)	168 (7)	101 (4)	3.38	0.97	1833	187 (10)	685 (37)	683 (37)	188 (10)	89 (5)	0.056
	c.	3.76	0.92	2259	482 (21)	956 (42)	671 (30)	97 (4)	54 (2)	3.63	0.95	1839	320 (17)	765 (42)	574 (31)	124 (7)	56 (3)	0.000 ***
	d.	3.95	0.93	2259	684 (30)	946 (42)	503 (22)	75 (3)	52 (2)	3.87	0.96	1836	521 (28)	748 (41)	424 (23)	98 (5)	44 (2)	0.024 *
	e.	3.91	0.96	2259	678 (30)	907 (40)	538 (24)	68 (3)	68 (3)	3.85	0.99	1838	526 (29)	715 (39)	441 (24)	103 (6)	52 (3)	0.093
S2	f.	3.13	1.06	2260	219 (10)	584 (26)	913 (40)	353 (16)	191 (8)	3.09	1.09	1838	178 (10)	477 (26)	706 (38)	294 (16)	183 (10)	0.333
	g.	3.35	1.04	2263	303 (13)	707 (31)	874 (39)	235 (10)	143 (6)	3.27	1.06	1835	228 (12)	524 (29)	722 (39)	236 (13)	126 (7)	0.003 **
	h.	2.96	1.15	2261	202 (9)	516 (23)	861 (38)	345 (15)	337 (15)	2.92	1.18	1838	167 (9)	417 (23)	659 (36)	300 (16)	295 (16)	0.252
	i.	2.79	1.19	2262	161 (7)	464 (21)	829 (37)	354 (16)	454 (20)	2.78	1.20	1828	138 (8)	365 (20)	662 (36)	286 (16)	376 (21)	0.626
	j.	2.94	1.21	2258	224 (10)	516 (23)	814 (36)	304 (13)	400 (18)	2.95	1.20	1834	186 (10)	418 (23)	654 (36)	272 (15)	304 (17)	0.813
	k.	3.54	1.13	2255	492 (22)	762 (34)	615 (27)	247 (11)	139 (6)	3.46	1.10	1837	318 (17)	658 (36)	527 (29)	219 (12)	115 (6)	0.014 *
	a.	3.59	0.89	2174	285 (13)	961 (44)	748 (34)	113 (5)	68 (3)	3.53	0.96	1790	244 (14)	732 (41)	623 (35)	105 (6)	86 (5)	0.073
	b.	3.35	0.91	2165	181 (8)	773 (36)	933 (43)	188 (9)	90 (4)	3.29	0.96	1785	155 (9)	583 (33)	772 (43)	175 (10)	100 (6)	0.021 *
	c.	3.73	0.85	2166	360 (17)	102 (47)	654 (30)	82 (4)	43 (2)	3.61	0.94	1786	285 (16)	737 (41)	600 (34)	106 (6)	59 (3)	0.000 ***
	d.	3.98	0.86	2170	620 (29)	101 (47)	440 (20)	58 (3)	36 (2)	3.88	0.91	1787	479 (27)	754 (42)	448 (25)	73 (4)	33 (2)	0.000 ***
	e.	3.97	0.89	2170	639 (29)	980 (45)	441 (20)	69 (3)	41 (2)	3.86	0.97	1781	503 (28)	701 (39)	443 (25)	90 (5)	44 (2)	0.000 ***
S4	f.	3.03	1.05	2168	165 (8)	531 (25)	858 (40)	426 (20)	189 (9)	2.98	1.08	1785	143 (8)	390 (22)	737 (41)	313 (18)	202 (11)	0.230
	g.	3.19	1.05	2173	208 (10)	644 (30)	831 (38)	326 (15)	164 (8)	3.19	1.05	1786	190 (11)	481 (27)	731 (41)	249 (14)	136 (8)	0.736
	h.	2.81	1.08	2175	125 (6)	411 (19)	860 (40)	475 (22)	303 (14)	2.87	1.10	1780	118 (7)	364 (20)	710 (40)	336 (19)	252 (14)	0.072
	i.	2.58	1.14	2159	97 (5)	353 (16)	757 (35)	457 (21)	494 (23)	2.65	1.16	1784	99 (6)	291 (16)	683 (38)	300 (17)	411 (23)	0.063
	j.	2.86	1.17	2172	167 (8)	491 (23)	746 (34)	399 (18)	369 (17)	2.91	1.18	1787	156 (9)	397 (22)	669 (37)	263 (15)	303 (17)	0.134
	k.	3.61	1.08	2169	461 (21)	821 (38)	585 (27)	176 (8)	126 (6)	3.60	1.11	1787	391 (22)	658 (37)	476 (27)	145 (8)	116 (7)	0.746
	a.	3.65	0.87	1716	228 (13)	823 (48)	546 (32)	69 (4)	50 (3)	3.65	0.87	1417	215 (15)	629 (44)	462 (33)	82 (6)	28 (2)	0.878
	b.	3.14	0.95	1713	93 (5)	516 (30)	772 (45)	207 (12)	125 (7)	3.21	0.99	1417	122 (9)	408 (29)	618 (44)	175 (12)	93 (7)	0.146
	c.	3.57	0.88	1712	199 (12)	765 (45)	602 (35)	93 (5)	52 (3)	3.61	0.91	1412	209 (15)	615 (44)	457 (32)	92 (7)	39 (3)	0.047 *
	d.	3.99	0.84	1711	482 (28)	820 (48)	344 (20)	41 (2)	25 (1)	4.03	0.86	1419	447 (32)	638 (45)	279 (20)	35 (2)	19 (1)	0.176
	e.	3.99	0.89	1715	506 (30)	800 (47)	326 (19)	47 (3)	36 (2)	4.03	0.88	1417	461 (33)	611 (43)	287 (20)	36 (3)	22 (2)	0.243
S6	f.	2.66	1.17	1716	92 (5)	336 (20)	549 (32)	373 (22)	367 (21)	2.70	1.19	1414	90 (6)	286 (20)	451 (32)	286 (20)	301 (21)	0.280
	g.	2.79	1.13	1714	97 (6)	379 (22)	581 (34)	374 (22)	283 (16)	2.85	1.13	1413	95 (7)	317 (22)	493 (35)	295 (21)	213 (15)	0.093
	h.	2.28	1.16	1713	64 (4)	201 (12)	471 (28)	387 (23)	590 (34)	2.37	1.18	1412	60 (4)	192 (14)	409 (29)	297 (21)	454 (32)	0.008 **
	i.	2.14	1.16	1712	44 (3)	195 (11)	432 (25)	325 (19)	715 (42)	2.23	1.24	1410	81 (6)	143 (10)	376 (27)	230 (16)	581 (41)	0.068
	j.	2.47	1.24	1712	98 (6)	287 (17)	459 (27)	350 (20)	519 (30)	2.66	1.28	1410	128 (9)	250 (18)	410 (29)	262 (19)	361 (26)	0.000 ***
	k.	3.64	1.09	1713	385 (22)	658 (38)	430 (25)	144 (8)	96 (6)	3.65	1.05	1415	301 (21)	568 (40)	364 (26)	115 (8)	68 (5)	0.878

Software

a. Word processing software
b. Spreadsheet
c. Presentation software
d. Online communication software (e.g. E-mail)
e. Online information searching tools (e.g. browser, search engine)
f. Web design/editing software
g. Computer graphic design (e.g. drawing and photo editing)
h. Multi-media design software (e.g. animation design)
i. Programming (e.g. Logo and Java)
j. Audio/Video editing software (e.g. editing and file format conversion)
k. Chinese input

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.3 Students' self-evaluated levels of proficiency in hardware use ([S6]SQ17a-j)

Class levels	Hardware	MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all										
S2	a.	3.76	1.01	2264	548	(24)	925	(41)	588	(26)	110	(5)	93	(4)	3.62	1.08	1841	412	(22)	663	(36)	528	(29)	131	(7)	106	(6)	0.000 ***
	b.	3.56	1.12	2264	487	(21)	771	(34)	682	(30)	164	(7)	161	(7)	3.46	1.14	1839	351	(19)	611	(33)	559	(30)	166	(9)	151	(8)	0.007 **
	c.	3.53	1.17	2260	507	(22)	743	(33)	633	(28)	193	(9)	184	(8)	3.50	1.17	1841	389	(21)	625	(34)	507	(28)	162	(9)	158	(9)	0.299
	d.	3.20	1.24	2265	356	(16)	624	(28)	726	(32)	234	(10)	326	(14)	3.19	1.25	1843	295	(16)	500	(27)	577	(31)	207	(11)	263	(14)	0.639
	e.	3.18	1.26	2263	366	(16)	603	(27)	711	(31)	241	(11)	342	(15)	3.13	1.27	1832	282	(15)	459	(25)	607	(33)	183	(10)	301	(16)	0.116
	f.	2.93	1.29	2263	277	(12)	509	(22)	748	(33)	251	(11)	479	(21)	2.88	1.31	1839	233	(13)	375	(20)	587	(32)	233	(13)	412	(22)	0.076
	g.	3.37	1.22	2261	448	(20)	663	(29)	675	(30)	226	(10)	249	(11)	3.32	1.21	1830	331	(18)	519	(28)	588	(32)	187	(10)	205	(11)	0.133
	h.	3.40	1.23	2262	478	(21)	652	(29)	688	(30)	184	(8)	260	(12)	3.35	1.24	1842	388	(21)	490	(27)	555	(30)	199	(11)	209	(11)	0.153
	i.	3.43	1.20	2265	454	(20)	714	(32)	678	(30)	181	(8)	238	(11)	3.40	1.20	1840	380	(21)	524	(28)	568	(31)	187	(10)	180	(10)	0.306
	j.	4.00	0.91	2264	748	(33)	914	(40)	487	(21)	80	(4)	35	(2)	3.91	0.96	1836	556	(30)	737	(40)	405	(22)	99	(5)	38	(2)	0.012 *
S4	a.	3.73	0.94	2179	432	(20)	970	(45)	600	(28)	105	(5)	71	(3)	3.62	1.02	1792	351	(20)	700	(39)	538	(30)	117	(7)	86	(5)	0.001 ***
	b.	3.58	1.08	2175	436	(20)	830	(38)	621	(29)	143	(7)	145	(7)	3.55	1.08	1788	359	(20)	626	(35)	538	(30)	164	(9)	100	(6)	0.057
	c.	3.56	1.12	2175	429	(20)	842	(39)	580	(27)	159	(7)	166	(8)	3.58	1.11	1792	384	(21)	637	(36)	513	(29)	141	(8)	117	(7)	0.991
	d.	3.15	1.18	2177	248	(11)	658	(30)	738	(34)	230	(11)	304	(14)	3.20	1.21	1791	254	(14)	511	(29)	600	(33)	183	(10)	243	(14)	0.231
	e.	3.23	1.20	2178	306	(14)	674	(31)	686	(31)	238	(11)	273	(13)	3.18	1.22	1790	252	(14)	507	(28)	604	(34)	170	(9)	259	(14)	0.098
	f.	2.79	1.22	2175	161	(7)	467	(21)	790	(36)	276	(13)	481	(22)	2.86	1.25	1790	170	(9)	387	(22)	641	(36)	204	(11)	389	(22)	0.128
	g.	3.21	1.17	2173	282	(13)	664	(31)	722	(33)	240	(11)	266	(12)	3.23	1.18	1781	252	(14)	509	(29)	641	(36)	158	(9)	221	(12)	0.878
	h.	3.19	1.23	2174	326	(15)	603	(28)	719	(33)	214	(10)	312	(14)	3.20	1.26	1788	301	(17)	452	(25)	602	(34)	166	(9)	267	(15)	0.867
	i.	3.33	1.19	2176	371	(17)	666	(31)	703	(32)	189	(9)	248	(11)	3.34	1.18	1790	315	(18)	518	(29)	608	(34)	156	(9)	194	(11)	0.686
	j.	3.97	0.91	2172	664	(31)	930	(43)	460	(21)	75	(3)	43	(2)	3.89	0.94	1786	504	(28)	732	(41)	438	(25)	72	(4)	41	(2)	0.002 **
S6	a.	3.72	0.92	1722	317	(18)	784	(46)	480	(28)	96	(6)	45	(3)	3.75	0.92	1414	281	(20)	649	(46)	372	(26)	78	(5)	35	(2)	0.238
	b.	3.58	1.05	1719	315	(18)	685	(40)	500	(29)	120	(7)	99	(6)	3.64	1.03	1414	277	(20)	597	(42)	368	(26)	102	(7)	70	(5)	0.062
	c.	3.57	1.09	1716	325	(19)	691	(40)	447	(26)	137	(8)	117	(7)	3.73	0.98	1416	315	(22)	589	(42)	378	(27)	84	(6)	49	(3)	0.000 ***
	d.	2.91	1.25	1715	160	(9)	447	(26)	535	(31)	234	(14)	339	(20)	3.06	1.17	1417	115	(8)	451	(32)	462	(33)	180	(13)	209	(15)	0.001 ***
	e.	3.14	1.20	1721	206	(12)	530	(31)	530	(31)	216	(13)	239	(14)	3.26	1.21	1414	210	(15)	463	(33)	393	(28)	177	(12)	172	(12)	0.015 *
	f.	2.52	1.27	1718	120	(7)	283	(16)	496	(29)	289	(17)	530	(31)	2.68	1.25	1413	95	(7)	305	(22)	432	(31)	217	(15)	363	(26)	0.000 ***
	g.	2.92	1.20	1722	139	(8)	458	(27)	554	(32)	270	(16)	301	(17)	3.09	1.19	1414	154	(11)	413	(29)	456	(32)	190	(13)	200	(14)	0.000 ***
	h.	2.87	1.27	1720	190	(11)	362	(21)	572	(33)	237	(14)	360	(21)	3.01	1.30	1411	206	(15)	317	(22)	450	(32)	171	(12)	268	(19)	0.002 **
	i.	3.06	1.23	1706	205	(12)	458	(27)	555	(33)	212	(12)	275	(16)	3.22	1.21	1415	205	(14)	427	(30)	442	(31)	155	(11)	186	(13)	0.000 ***
	j.	3.94	0.89	1718	478	(28)	768	(45)	390	(23)	49	(3)	32	(2)	3.96	0.83	1414	380	(27)	665	(47)	312	(22)	45	(3)	12	(1)	0.716

Hardware

a. Printer
b. CD-ROM (CD-R or DVD-R) Writer
c. Digital Camera
d. Digital Video Recorder
e. Scanner
f. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)]
g. Network Devices (e.g. Domestic Network Devices)
h. Portable Computer Game Devices
i. Portable Multi-media Player Devices
j. Use of Keyboard

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.1.2 Attitude towards Social and Ethical Issues of Using IT

School heads tended to be satisfied with students' attitude towards social and ethical issues of using IT

Regarding students' attitude towards social and ethical issues of using IT, 49% of school heads were satisfied or very satisfied that students agreed that the use of IT should comply with ethical and moral standard as set out in society. No statistically significant difference was observed in MS2 (Table 7.4, [S1]HSQ1g).

Table 7.4 School heads' levels of satisfaction with students' attitude towards social and ethical issues of using IT ([S1]HSQ1g)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students agree that the use of IT should comply with ethical and moral standard as set out in society."									
MS1	3.43	0.68	397	10 (3)	182 (46)	175 (44)	28 (7)	2 (1)	0.096
MS2	3.51	0.68	354	12 (3)	182 (51)	134 (38)	26 (7)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students generally showed awareness of social and ethical issues of using IT

The appropriateness of students' attitude towards using IT can be measured by students' views towards the social and ethical issues in various computer-related activities. Students generally show themselves as responsible users of IT. Table 7.5 ([S6]SQ20a-f) shows a trend of increase in S2 to S6 students' self-awareness of social and ethical issues in using IT. In MS1, they agreed or strongly agreed to: "beware of e-mail bombs or the spread of computer virus" (68% of S2, 73% of S4 and 80% of S6) and "avoid spending long hours on computer or online games" (46% of S2, 57% of S4 and 71% of S6). The mean ratings fell in the range of 3.37-3.96 (SD:1.12-1.13) for S2, 3.60-4.02 (SD:1.00-1.01) for S4 and 3.85-4.15 (SD:0.93-0.94) for S6 students on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. 38% to 60% of the students disagreed or strongly disagreed on improper social and ethical activities related to the use of IT: "surfing pornographic websites" (60% of S2, 56% of S4 and 54% of S6), "disclosing personal particulars to strangers online" (56% of S2, 54% of S4 and 60% of S6) and "sending or forwarding unnecessary e-mails or messages" (38% of S2, 44% of S4 and 51% of S6). The mean ratings fell in the range of 2.18-2.88 (SD:1.25-1.34) for S2, 2.32-2.74 (SD:1.21-1.34) for S4 and 2.31-2.60 (SD:1.22-1.39) for S6 students on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. On the other hand, 35% to 40% of the surveyed secondary school students (40% of S2, 36% of S4 and 35% of S6) disagreed or strongly disagreed on "using pirated software", with mean ratings of 2.65 (SD:1.20), 2.72 (SD:1.14) and 2.76 (SD:1.05) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'.

A statistically significant decrease was observed in the percentages of S2 (from 60% to 58%) and S4 students (from 56% to 51%) who disagreed or strongly disagreed on "surfing pornographic websites" in MS2. A statistically significant decrease was also observed in the percentages of S4 students who agreed or strongly agreed to "avoid spending long hours on computer or online games" (from 57% to 53%) and "beware of e-mail bombs or the spread of computer virus" (from 73% to 68%) in MS2. Conversely, a statistically significant increase was noted in the percentages of S6 students who agreed or strongly agreed to "avoid spending long hours on computer or online games" (from 71% to 74%) and "beware of e-mail bombs or the spread of computer virus" (from 80% to 82%) in MS2.

Table 7.5 Students' levels of agreement to the social and ethical issues related to the use of IT ([S6]SQ20a-f)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Strongly agree		Agree		Neutral		Disagree		Strongly disagree				Strongly agree		Agree		Neutral		Disagree		Strongly disagree		
S2	a.	3.37	1.12	2267	373	(16)	672	(30)	851	(38)	169	(7)	202	(9)	3.42	1.12	1835	340	(19)	521	(28)	700	(38)	113	(6)	162	(9)	0.272
	b.	3.96	1.13	2264	960	(42)	581	(26)	526	(23)	78	(3)	119	(5)	3.89	1.15	1835	722	(39)	485	(26)	452	(25)	66	(4)	110	(6)	0.078
	c.	2.88	1.34	2263	347	(15)	382	(17)	662	(29)	386	(17)	486	(21)	2.90	1.39	1833	324	(18)	282	(15)	534	(29)	268	(15)	426	(23)	0.679
	d.	2.18	1.29	2260	183	(8)	164	(7)	540	(24)	368	(16)	1005	(44)	2.28	1.35	1835	185	(10)	148	(8)	451	(25)	269	(15)	782	(43)	0.041*
	e.	2.65	1.20	2263	204	(9)	228	(10)	922	(41)	383	(17)	526	(23)	2.59	1.25	1828	184	(10)	170	(9)	668	(37)	331	(18)	475	(26)	0.079
	f.	2.30	1.25	2259	170	(8)	173	(8)	647	(29)	438	(19)	830	(37)	2.37	1.31	1833	170	(9)	167	(9)	503	(27)	320	(17)	674	(37)	0.276
S4	a.	3.60	1.00	2177	395	(18)	853	(39)	699	(32)	131	(6)	99	(5)	3.53	1.04	1797	311	(17)	654	(36)	616	(34)	105	(6)	110	(6)	0.031 *
	b.	4.02	1.01	2174	859	(40)	712	(33)	469	(22)	62	(3)	71	(3)	3.94	1.07	1794	683	(38)	538	(30)	427	(24)	76	(4)	70	(4)	0.019 *
	c.	2.74	1.34	2166	285	(13)	351	(16)	586	(27)	406	(19)	538	(25)	2.83	1.34	1789	246	(14)	321	(18)	525	(29)	273	(15)	426	(24)	0.093
	d.	2.32	1.28	2173	180	(8)	187	(9)	594	(27)	404	(19)	808	(37)	2.41	1.29	1792	152	(8)	192	(11)	526	(29)	292	(16)	629	(35)	0.040 *
	e.	2.72	1.14	2173	188	(9)	220	(10)	979	(45)	372	(17)	413	(19)	2.70	1.15	1791	148	(8)	191	(11)	779	(43)	318	(18)	356	(20)	0.682
	f.	2.37	1.21	2172	155	(7)	188	(9)	650	(30)	482	(22)	697	(32)	2.43	1.24	1786	132	(7)	187	(10)	567	(32)	338	(19)	563	(31)	0.055
S6	a.	3.85	0.94	1723	424	(25)	788	(46)	389	(23)	71	(4)	51	(3)	3.93	0.92	1413	387	(27)	669	(47)	274	(19)	42	(3)	42	(3)	0.008 **
	b.	4.15	0.93	1715	734	(43)	633	(37)	276	(16)	27	(2)	46	(3)	4.23	0.96	1413	695	(49)	465	(33)	181	(13)	31	(2)	41	(3)	0.002 **
	c.	2.60	1.39	1719	213	(12)	297	(17)	322	(19)	364	(21)	523	(30)	2.68	1.43	1413	209	(15)	243	(17)	255	(18)	293	(21)	412	(29)	0.250
	d.	2.38	1.22	1721	125	(7)	159	(9)	496	(29)	400	(23)	540	(31)	2.35	1.29	1412	134	(9)	111	(8)	361	(26)	312	(22)	494	(35)	0.142
	e.	2.76	1.05	1719	114	(7)	194	(11)	823	(48)	338	(20)	250	(15)	2.78	1.18	1410	157	(11)	144	(10)	579	(41)	285	(20)	244	(17)	0.812
	f.	2.31	1.24	1720	143	(8)	133	(8)	422	(25)	443	(26)	580	(34)	2.33	1.28	1406	130	(9)	117	(8)	323	(23)	349	(25)	489	(35)	0.979

Social and ethical issues related to the use of IT

a. Avoid spending long hours on computer/online games
b. Beware of E-mail bombs or the spread of computer virus
c. Sending/forwarding unnecessary E-mails/messages
d. Surfing pornographic websites
e. Using pirated (reproduced) software
f. Disclosing personal particulars to strangers online

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.1.3 Belief and Attitude towards Use of IT for Learning

School heads were satisfied with students' positive attitude towards using IT for learning

87% of school heads were satisfied or very satisfied that students possessed positive attitude towards using IT in their learning in MS1. No statistically significant difference was observed in MS2 (Table 7.6, [S1]HSQ1b).

Table 7.6 School heads' levels of satisfaction with students' belief and attitude towards the use of IT for learning ([S1]HSQ1b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option										*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"Students possess positive attitude towards using IT in their learning."														
MS1	3.99	0.53	397	51	(13)	295	(74)	48	(12)	3	(1)	0	(0)	0.423
MS2	3.97	0.51	354	41	(12)	261	(74)	52	(15)	0	(0)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students, teachers and parents perceived that IT had positive impact on learning

Regarding the perceived impact of IT on students' learning outcomes, students, teachers and parents showed very positive perception of learning with IT. Students' levels of agreement on their learning outcome as derived from learning with IT is depicted in Table 7.7 ([S6]SQ15a.i-ix). The perceived outcome that was agreed or strongly agreed by slightly more than half of the surveyed students in MS1 was "widen perspective through more interaction with the outside world" (52% of S2, 56% of S4 and 60% of S6), with mean ratings of 3.59 (SD:0.92), 3.61 (SD:0.93) and 3.63(SD:0.89) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. It was followed by "strengthen understanding of subject knowledge" (49% of S2, 51% of S4 and 59% of S6). There was a slightly higher proportion of S6 than S4 or S2 students who agreed or strongly agreed that "enhance interest in self-learning of subject content" (47% of S2, 49% of S4 and 55% of S6) and "enhance information processing ability" (46% of S2, 46% of S4 and 56% of S6) were impacts of IT on learning outcomes. There was a progressive decrease from S2 to S6 in the proportion of students choosing 'agree' or 'strongly agree' on all the other listed impacts. 38%, 34% and 30% of S2, S4 and S6 students respectively agreed or strongly agreed to the effect of using IT to "enhance communication and presentation skills", with mean ratings of 3.30 (SD:0.92), 3.20 (SD:0.91) and 3.02 (SD:0.94) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. There was a statistically significant increase in the learning outcome of "enhance information processing ability" for S2 students (from 46% to 48%) in MS2. For S4 students, a statistically significant increase was noted in the following learning outcomes: "enhance academic performance" (from 35% to 40%), "enhance interest in self-learning of subject content" (from 49% to 52%), "enhance planning and learning management skills" (from 37% to 40%) and "enhance communication and presentation skills" (from 34% to 37%). For S6 students, a statistically significant decrease was observed in the learning outcomes of "strengthen understanding of subject knowledge" (from 59% to 54%) and "enhance interest in self-learning of subject content" (from 55% to 52%).

Teachers' perception of outcomes as derived from students' learning with IT is depicted in Table 7.8 ([S5]TQ15a-i). In MS1, about 70% of the teachers agreed or strongly agreed that learning with IT could widen perspective through more interaction with the outside world (69%) as well as enhancing students' self-learning and interest in learning subject content (67%). In addition, they agreed or strongly agreed that IT could strengthen students' understanding of the subject content (64%) and enhance information processing ability (64%). Around 40% of the teachers agreed or strongly agreed that IT could enhance students' planning and learning management skills (42%), provide opportunities for collaborative learning (40%) as well as enhance academic performance (39%) and creativity (38%). 31% of the teachers agreed or strongly agreed that IT could enhance students' communication and presentation skills. A statistically significant increase was noted in the percentages of teachers who agreed or strongly agreed with the learning outcome of using IT for students to "enhance academic performance" (from 39% to 42%) in MS2.

Table 7.9 ([S7]PQ5a-f) presents the parents' belief of the impact of IT on the learning outcomes. In MS1, relatively high percentages of the parents agreed or strongly agreed to the following learning outcomes as derived from their children's learning with IT: providing rich learning resources for their children's learning (66%) and widening children's perspective through more interaction with the outside world (61%). The items which were rated at or below 50% were providing collaborative learning opportunities for the children (50%), enhancing their interest in self-learning of subject matter (49%), enhancing their academic performance (40%) and enhancing their communication and presentation skills (37%). In MS2, no statistically significant difference was identified in all the learning outcome of using IT for students.

Table 7.7 Students' levels of agreement to their learning outcomes as derived from learning with IT ([S6]SQ15a.i-ix)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Strongly agree		Agree		Neutral		Disagree		Strongly disagree				Strongly agree		Agree		Neutral		Disagree		Strongly disagree		
S2	i.	3.38	0.85	2271	227	10	662	29	1190	52	131	6	62	3	3.42	0.87	1850	217	12	549	30	931	50	96	5	56	3	0.300
	ii.	3.49	0.83	2267	219	10	891	39	1000	44	97	4	60	3	3.52	0.85	1844	212	11	717	39	786	43	82	4	47	3	0.377
	iii.	3.47	0.86	2271	238	10	850	37	996	44	121	5	66	3	3.51	0.90	1835	243	13	661	36	772	42	100	5	58	3	0.349
	iv.	3.35	0.82	2270	176	8	696	31	1195	53	142	6	61	3	3.39	0.86	1843	190	10	566	31	922	50	111	6	55	3	0.157
	v.	3.44	0.83	2264	216	10	805	36	1069	47	115	5	59	3	3.51	0.86	1846	229	12	662	36	823	45	85	5	47	3	0.031 *
	vi	3.34	0.91	2271	233	10	677	30	1059	47	220	10	81	4	3.39	0.92	1844	227	12	551	30	850	46	154	8	62	3	0.129
	vii	3.30	0.92	2270	224	10	643	28	1083	48	229	10	91	4	3.35	0.94	1840	227	12	501	27	867	47	180	10	65	4	0.191
	viii	3.43	0.91	2267	260	11	779	34	989	44	163	7	76	3	3.48	0.92	1843	235	13	663	36	767	42	114	6	64	3	0.134
	ix	3.59	0.92	2267	372	16	816	36	920	41	83	4	75	3	3.59	0.93	1846	325	18	642	35	728	39	102	6	49	3	0.982
S4	i.	3.29	0.81	2176	140	6	640	29	1158	53	177	8	61	3	3.36	0.84	1787	146	8	573	32	899	50	112	6	58	3	0.001 ***
	ii.	3.51	0.79	2177	181	8	937	43	907	42	115	5	38	2	3.50	0.81	1788	147	8	764	43	752	42	81	5	44	2	0.998
	iii.	3.47	0.84	2178	208	10	850	39	917	42	159	7	44	2	3.51	0.82	1786	170	10	748	42	737	41	88	5	42	2	0.036 *
	iv.	3.31	0.80	2174	140	6	664	31	1133	52	194	9	43	2	3.35	0.81	1787	125	7	583	33	918	51	114	6	47	3	0.032 *
	v.	3.45	0.80	2171	178	8	824	38	1011	47	117	5	42	2	3.47	0.81	1787	145	8	716	40	797	45	85	5	44	2	0.286
	vi	3.29	0.85	2177	172	8	629	29	1090	50	235	11	51	2	3.31	0.85	1789	152	9	509	28	928	52	145	8	55	3	0.429
	vii	3.20	0.91	2176	169	8	567	26	1047	48	313	14	80	4	3.28	0.89	1788	149	8	516	29	877	49	178	10	69	4	0.002 **
	viii	3.38	0.91	2174	220	10	741	34	932	43	209	10	71	3	3.40	0.87	1789	174	10	609	34	817	46	140	8	50	3	0.765
	ix.	3.61	0.93	2170	356	16	870	40	756	35	122	6	67	3	3.60	0.92	1780	276	16	711	40	644	36	96	5	53	3	0.364
S6	i.	3.23	0.79	1727	75	4	516	30	908	53	182	11	45	3	3.21	0.82	1421	58	4	410	29	785	55	103	7	65	5	0.477
	ii.	3.56	0.78	1724	119	7	892	52	586	34	93	5	33	2	3.49	0.79	1419	74	5	699	49	537	38	69	5	40	3	0.006 **
	iii.	3.52	0.83	1726	137	8	817	47	613	35	120	7	39	2	3.45	0.84	1418	95	7	637	45	544	38	95	7	47	3	0.012 *
	iv.	3.25	0.81	1720	79	5	566	33	828	48	207	12	40	2	3.28	0.79	1415	60	4	474	34	719	51	124	9	38	3	0.453
	v.	3.54	0.81	1724	147	9	812	47	620	36	115	7	30	2	3.54	0.76	1418	118	8	626	44	599	42	55	4	20	1	0.305
	vi	3.17	0.89	1720	99	6	496	29	795	46	269	16	63	4	3.23	0.95	1419	123	9	409	29	615	43	211	15	61	4	0.054
	vii	3.02	0.94	1726	77	4	440	26	758	44	345	20	105	6	3.00	0.97	1419	64	5	357	25	624	44	256	18	118	8	0.971
	viii	3.22	0.89	1724	97	6	574	33	728	42	268	16	57	3	3.27	0.96	1419	116	8	472	33	572	40	190	13	69	5	0.166
	ix	3.63	0.89	1723	254	15	769	45	552	32	108	6	40	2	3.63	0.88	1417	205	14	634	45	460	32	90	6	28	2	0.964

Students' learning outcomes as derived from learning with IT

i. Enhance academic performance
ii. Strengthen understanding of subject knowledge
iii. Enhance interest in self-learning of subject content
iv. Enhance planning and learning management skills
v. Enhance information processing ability
vi. Enhance creativity
vii. Enhance communication and presentation skills
viii. Provide opportunities for collaborative learning
ix. Widen perspective through more interaction with the outside world

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.8 Teachers' levels of agreement to students' learning outcomes as derived from learning with IT ([S5]TQ15a-i)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Strongly agree		Agree		Neutral		Disagree										Strongly disagree	
a.	3.28	0.71	2722	45	(2)	1012	(37)	1356	(50)	280	(10)	29	(1)	3.34	0.69	2029	40	(2)	811	(40)	1002	(49)	159	(8)	17	(1)	0.004 **
b.	3.61	0.65	2720	84	(3)	1646	(61)	857	(32)	118	(4)	15	(1)	3.62	0.63	2028	69	(3)	1219	(60)	653	(32)	80	(4)	7	(0)	0.816
c.	3.69	0.67	2721	172	(6)	1660	(61)	763	(28)	112	(4)	14	(1)	3.71	0.65	2030	127	(6)	1264	(62)	569	(28)	59	(3)	11	(1)	0.339
d.	3.32	0.73	2718	59	(2)	1081	(40)	1269	(47)	280	(10)	29	(1)	3.34	0.73	2029	59	(3)	817	(40)	934	(46)	200	(10)	19	(1)	0.268
e.	3.64	0.66	2719	138	(5)	1604	(59)	864	(32)	98	(4)	15	(1)	3.64	0.66	2029	105	(5)	1176	(58)	669	(33)	69	(3)	10	(0)	0.643
f.	3.24	0.77	2721	60	(2)	979	(36)	1289	(47)	345	(13)	48	(2)	3.28	0.78	2031	60	(3)	755	(37)	939	(46)	239	(12)	38	(2)	0.128
g.	3.05	0.85	2717	55	(2)	781	(29)	1226	(45)	547	(20)	108	(4)	3.08	0.85	2029	51	(3)	592	(29)	926	(46)	381	(19)	79	(4)	0.259
h	3.21	0.83	2717	70	(3)	1004	(37)	1149	(42)	418	(15)	76	(3)	3.25	0.80	2029	51	(3)	780	(38)	868	(43)	292	(14)	38	(2)	0.131
i.	3.71	0.72	2720	241	(9)	1624	(60)	716	(26)	114	(4)	25	(1)	3.71	0.71	2025	180	(9)	1177	(58)	569	(28)	89	(4)	10	(0)	0.410

Students' learning outcomes as derived from their learning with IT

a. Enhance academic performance
b. Strengthen understanding of the subject content
c. Enhance self-learning and interest in learning the subject content
d. Enhance planning and learning management skills
e. Enhance information processing ability
f. Enhance creativity
g. Enhance communication and presentation skills
h. Provide opportunities for collaborative learning
i. Widen perspective through more interaction with the outside world

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.9 Parents' levels of agreement on the learning outcomes as derived from students' learning with IT ([S7]PQ5a-f)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Strongly agree		Agree		Neutral		Disagree										Strongly disagree	
a.	3.75	0.69	6004	677	(11)	3312	(55)	1870	(31)	127	(2)	18	(0)	3.73	0.70	4355	484	(11)	2372	(54)	1379	(32)	99	(2)	21	(0)	0.468
b.	3.34	0.76	5987	346	(6)	2040	(34)	2976	(50)	572	(10)	52	(1)	3.35	0.77	4331	254	(6)	1486	(34)	2138	(49)	405	(9)	47	(1)	0.648
c.	3.46	0.76	5978	395	(7)	2496	(42)	2585	(43)	460	(8)	42	(1)	3.44	0.77	4339	287	(7)	1776	(41)	1889	(44)	356	(8)	32	(1)	0.256
d.	3.24	0.84	5973	341	(6)	1872	(31)	2727	(46)	933	(16)	100	(2)	3.24	0.86	4332	253	(6)	1387	(32)	1947	(45)	648	(15)	97	(2)	0.264
e.	3.45	0.79	5977	396	(7)	2564	(43)	2412	(40)	537	(9)	69	(1)	3.45	0.80	4339	296	(7)	1872	(43)	1718	(40)	398	(9)	54	(1)	0.499
f.	3.66	0.79	5972	686	(11)	2988	(50)	1914	(32)	322	(5)	62	(1)	3.63	0.81	4312	477	(11)	2118	(49)	1415	(33)	241	(6)	61	(1)	0.159

Learning outcomes as derived from students' learning with IT

a. Provide rich learning resources to your child for learning
b. Enhance your child's academic performance
c. Enhance your child's interest in self-learning of subject matter
d. Enhance your child's communication and presentation skills
e. Provide collaborative learning opportunities for your child
f. Widen your child's perspective through more interaction with the outside world

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students liked to use computers for learning

As far as the acceptance of using IT as a tool for learning was concerned, students liked to use computers for learning. 80% of S2, 82% of S4 and 76% of S6 students indicated that they liked using computers for learning in class in MS1 (Table 7.10, [S6]SQ3a). A statistically significant decrease was noted in the percentages of S2 (from 80% to 79%) and S4 students (from 82% to 78%) who liked using computers for learning in class whereas a statistically significant increase was found in that of S6 students (from 76% to 77%) in MS2. In MS1, 60%, 62% and 58% of S2, S4 and S6 students respectively liked using computers for learning beyond school hours (Table 7.11, [S6]SQ11e). A statistically significant increase was observed in the percentages of S2 (from 60% to 71%), S4 (from 62% to 69%) and S6 (from 58% to 66%) students who liked using computers for learning beyond school hours in MS2.

The reasons that students liked using IT for learning in class are presented in Table 7.10 ([S6]SQ3b.ii). In MS1, among those students who liked to use computers in class, around 55% of the surveyed secondary school students expressed that their learning interest was enhanced (53% of S2, 57% of S4 and 60% of S6). Teachers' explanation and demonstration became more vivid and clear by using computers (53% of S2, 57% of S4 and 61% of S6). 34% of S2 students liked to use computers in class as they could work individually with computers. However, the proportion of students choosing this reason dropped to 26% and 25% for S4 and S6 students respectively. In MS2, there was a statistically significant decrease in the percentage of S2 students (from 53% to 48%) choosing the reason of "teachers' explanation and demonstration become more vivid and clear by using computers". The reason "can use the computer by yourself" was significantly increased from 26% to 31% for S4. For S6 students, a statistically significant decrease was identified in the reasons of "can use the computer by yourself" (from 25% to 18%) and "enhance learning interest" (from 60% to 50%).

Among those students who did not like using computers for learning in class, teachers' restriction of students' computer use was the most common reason. In MS1, the percentage of S2 students (63%) for the above reason was more than twice than that of S6 students (30%). There was a statistically significant decrease in S2 (from 63% to 56%) and S6 (from 30% to 22%) students for this item in MS2. 8% to12% of the surveyed secondary school students (8% of S2, 12% of S4 and 11% of S6) felt that insufficient computers was another reason for not liking to use IT for learning in class. There was a statistically significant increase in S2 students (from 5% to 9%) choosing the reason of "do not know how to use computers" in MS2 (Table 7.10, [S6]SQ3c).

Students showed moderate level of willingness in using IT for learning – a statistically significant increase was noted in students' level of willingness in this area

Students' attitude towards the use of IT in learning process is reflected by their interest in exploring innovative IT hardware and software and also by their willingness to allocate more time in using IT for learning. When students were asked about their interest in using innovative IT tools, techniques and applications, around 45% of the students showed interest in new technology in MS1. 46% of S2, 45% of S4 and 43% of S6 students were interested or very interested in the use of emerging innovative IT tools, techniques and applications, with mean ratings of 3.37 (SD:1.06), 3.34 (SD:1.01) and 3.29 (SD:0.98) respectively on a scale of 1 to 5 where 1 was 'not interested at all' and 5 was 'very interested' ([S6]SQ21). There was a statistically significant increase in this area for S2 (from 46% to 55%), S4 (from 45% to 53%) and S6 students (from 43% to 57%) in MS2. When students were further asked to indicate their willingness to allocate more time in using IT for learning, 36% of S2, 36% of S4 and 32% of S6 students reported that they were willing or very willing to do so in MS1, with mean ratings of 3.24 (SD:0.98), 3.25 (SD:0.91) and 3.15 (SD:0.91) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing' ([S6]SQ22). A statistically significant increase was noted in this area for S2 (from 36% to 45%), S4 (from 36% to 43%) and S6 students (from 32% to 36%) in MS2 (Table 7.12, [S6]SQ21,22).

Table 7.10 Whether students liked to use computers for learning in class and the reasons they liked or did not like to use computer for learning in class ([S6]SQ3a,b.ii,c)

Students liked to use the computers for learning in class	Percentage (%) choosing the option								
	S2		P-value	S4		P-value	S6		P-value
	MS1 (N=2279)	MS2 (N=1872)		MS1 (N=2182)	MS2 (N=1805)		MS1 (N=1727)	MS2 (N=1438)	
YES	80	79	0.000 ***	82	78	0.000 ***	76	77	0.000 ***
NO	20	21		18	22		24	23	
	(N=1828)	(N=1489)		(N=1787)	(N=1411)		(N=1312)	(N=1102)	
Reasons students liked to use computers for learning in class									
Can use the computer by yourself	34	37	0.324	26	31	0.003**	25	18	0.000 ***
Can use computers in small groups	8	9	0.276	6	6	0.792	7	5	0.057
Teachers' explanation and demonstration become more vivid and clear by using computers	53	48	0.003 **	57	54	0.137	61	64	0.214
Enhance learning interest	53	52	0.292	57	58	0.766	60	50	0.000 ***
Other reasons	16	14	0.164	15	17	0.110	14	17	0.050 *
Reasons students did not like to use computer for learning in class	(N=451)	(N=384)		(N=395)	(N=393)		(N=415)	(N=336)	
Do not know how to use computers	5	9	0.015 *	8	8	0.740	5	5	0.831
Insufficient number of computers	8	9	0.791	12	12	0.970	11	9	0.879
Teachers restrict our use of computers	63	56	0.042 *	44	48	0.303	30	22	0.026 *
Other reasons	38	34	0.208	48	43	0.146	71	69	0.394

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.11 Whether students liked to use computers for learning beyond school hours ([S6]SQ11e)

Students liked to use the computers for learning beyond school hours	Percentage (%) choosing the option								
	S2		P-value	S4		P-value	S6		P-value
	MS1 (N=2185)	MS2 (N=1578)		MS1 (N=2077)	MS2 (N=1507)		MS1 (N=1654)	MS2 (N=1171)	
YES	60	71	0.000 ***	62	69	0.000 ***	58	66	0.000 ***
NO	40	29		38	31		42	34	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.12 Students' interest in the use of emerging innovative IT tools, techniques and applications as well as their willingness to allocate more time in using IT for learning ([S6]SQ21,22)

Class levels	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option						Mean (1-5)	SD	N	Count (%) of Students choosing the option						
				Very interested	Interested	Quite interested (一般)	Not interested	Not interested at all					Very interested	Interested	Quite interested (一般)	Not interested	Not interested at all		
Levels of interest in the use of emerging innovative IT tools, techniques and applications Mean: 1="Not interested at all" and 5="Very interested"																			
S2	3.37	1.06	2251	334	(15)	688	(31)	843	(37)	243	(11)	143	(6)	3.62	0.94	1835	343	(19)	655	(36)	687	(37)	102	(6)	47	(3)	0.000***
S4	3.34	1.01	2165	265	(12)	706	(33)	806	(37)	284	(13)	104	(5)	3.58	0.90	1789	282	(16)	653	(37)	705	(39)	110	(6)	38	(2)	0.000***
S6	3.29	0.98	1716	167	(10)	560	(33)	676	(39)	225	(13)	88	(5)	3.61	0.86	1408	191	(14)	608	(43)	500	(36)	81	(6)	27	(2)	0.000***

Class levels	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option						Mean (1-5)	SD	N	Count (%) of Students choosing the option						
				Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing					Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing		
Levels of willingness to allocate more time in using IT for learning Mean: 1="Totally not willing" and 5="Very willing"																			
S2	3.24	0.98	2247	227	(10)	586	(26)	1061	(47)	236	(11)	138	(6)	3.46	0.92	1832	252	(14)	566	(31)	850	(46)	98	(5)	66	(4)	0.000***
S4	3.25	0.91	2160	183	(8)	595	(28)	1044	(48)	255	(12)	82	(4)	3.40	0.89	1772	205	(12)	542	(31)	846	(48)	123	(7)	56	(3)	0.000***
S6	3.15	0.91	1701	110	(6)	447	(26)	816	(48)	246	(14)	82	(5)	3.28	0.81	1410	84	(6)	424	(30)	741	(53)	122	(9)	40	(3)	0.000***

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.1.4 Learning Activities with IT

Students spent more time on using computers at home or in other places than in school

The extent to which students use computers for learning is reflected by the frequency in which they use computers in school and after school. Students were asked about the amount of time they spent per day on using computers in school, at home or in other places during the week prior to the conduct of the questionnaire survey. Tables 7.13 ([P6]SQ7g) and 7.14 ([P6]SQ8f) showed that secondary school students spent more time on computers at home or in other places than in school. In MS1, excluding the students who did not use computers in school, at home or in other places during the week prior to the conduct of the questionnaire survey, 35% or above of the students (48% of S2, 35% of S4 and 37% of S6) spent less than 2 hours per day in school and around 25% of the students (25% of S2, 25% of S4 and 26% of S6) spent less than 2 hours per day at home. The percentages of students spending 2 to less than 5 hours in using computers per day at home (32% of S2, 30% of S4 and 30% of S6) were twice the percentages of students spending the same range of time using computers per day in school (16% of S2, 15% of S4 and 15% of S6) in MS1. A statistically significant decrease was observed in the percentages of average hours that S2, S4 and S6 students spent per day using computers in school (MS1: 38%-40%; and MS2: 15%-22% of them reported spending 2 hours or above) in MS2 whereas a statistically significant increase was noted in the percentages of the average hours that students spent per day on using computers at home or in other places (MS1: 66%-68%; and MS2: 68%-74% of them spending 2 hours or above) in MS2.

Students were given the opportunities to use computers in class other than Computer or IT lessons

When students were asked about their usage of computers in school, the data revealed that there were considerable opportunities for secondary school students to use computers in class, other than in specific computer lessons. With the exclusion of computer lessons, 12% of S2, 23% of S4 and 25% of S6 students indicated that they did not use computers in class at all during the week prior to the conduct of the questionnaire survey in MS1. On the other hand, 72% of S2, 56% of S4 and 55% of S6 students reported that they had used computers 1 to 10 times in class while 16% of S2, 22% of S4 and 20% of S6 students reported that they used computers in class 11 times or more during the week prior to the conduct of the questionnaire survey in MS1. A statistically significant increase found in the frequency of S6 students in using computers for learning in class (from 14% to 20% reported using computers 11 to 20 times) whereas there was no statistically significant difference for S2 and S4 in MS2 (Table 7.15, [S6]SQ1).

Table 7.13 Average number of hour(s) that students spent per day on using computers (during lessons and after school) in school during the week prior to the conduct of the questionnaire survey ([S6]SQ7g)

Average number of hour(s)	Percentage (%) choosing the option											
	S2		$\chi^2_{(df=4)}$	*P*-value	S4		$\chi^2_{(df=4)}$	*P*-value	S6		$\chi^2_{(df=4)}$	*P*-value
	MS1 (N=2275)	MS2 (N=1857)			MS1 (N=2175)	MS2 (N=1800)			MS1 (N=1726)	MS2 (N=1428)		
10 hours or more	6	2			11	2			8	1		
5 to less than 10 hours	18	4			14	4			15	5		
2 to less than 5 hours	16	16	256.95	0.000***	15	12	321.45	0.000***	15	9	306.55	0.000***
less than 2 hours	48	60			35	41			37	40		
Nil	12	18			25	41			24	46		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.14 Average number of hour(s) that students spent per day on using computers at home/other places during the week prior to the conduct of the questionnaire survey ([S6]SQ8f)

Average number of hour(s)	Percentage (%) choosing the option											
	S2		$\chi^2_{(df=4)}$	*P*-value	S4		$\chi^2_{(df=4)}$	*P*-value	S6		$\chi^2_{(df=4)}$	*P*-value
	MS1 (N=2275)	MS2 (N=1857)			MS1 (N=2175)	MS2 (N=1795)			MS1 (N=1726)	MS2 (N=1428)		
10 hours or more	14	16			15	20			18	20		
5 to less than 10 hours	22	19			22	20			18	17		
2 to less than 5 hours	32	33	19.83	0.001**	30	34	42.50	0.000***	30	32	42.26	0.000***
less than 2 hours	25	27			25	23			26	27		
Nil	8	5			8	4			9	4		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.15 Other than Computer/IT lessons, the frequency of students' use of computers for learning (including teachers' use of computers for teaching) in class during the week prior to the conduct of the questionnaire survey ([S6]SQ1)

Average number of hour(s)	Percentage (%) choosing the option											
	S2		$\chi^2_{(df=4)}$	*P*-value	S4		$\chi^2_{(df=4)}$	*P*-value	S6		$\chi^2_{(df=4)}$	*P*-value
	MS1 (N=2279)	MS2 (N=1886)			MS1 (N=2182)	MS2 (N=1809)			MS1 (N=1727)	MS2 (N=1441)		
31 times or more	2	3			2	2			2	2		
21 to 30 times	3	3			5	4			4	3		
11 to 20 times	11	12	8.08	0.089	15	14	2.46	0.652	14	20	29.16	0.000***
1 to 10 times	72	69			56	57			55	53		
Nil	12	13			23	23			25	22		

Chi-square Test: *p<0.05; **p<0.01; ***p<0.001

Computers were used the most frequently in language subjects

When looking at the subjects (excluding Computer/IT) which computers were used the most frequently in class during the week prior to the conduct of the questionnaire survey, the top two frequently reported subjects in MS1 were English Language/English Literature (12% for S2, 15% for S4 and 20% for S6) and Chinese Language/Chinese Literature (11% for S2, 12% for S4 and 12% for S6). The pattern was similar for S2 and S4 students. The S6 group also indicated a similar pattern, except that they spent less time on Chinese Language/Chinese Literature (12%) and more time on Chemistry (13%). Both 11% of S4 and S6 students indicated that Biology or Human Biology was another subject which computer was used frequently in class. 9% or less of the respondents indicated that computers were frequently used in learning each of all other subjects. A statistically significant increase was noted in the percentages of S2 and S4 students who chose "English Language/English Literature" (MS1: 12%-15%; MS2: 14%-18%) and S6 students who chose "Chinese Language/Chinese Literature" (from 12% to 18%) in MS2 (Table 7.16, [S6]SQ2a).

Table 7.16 Subjects (excluding Computer/IT lessons) which computers were used the most frequently in class during the week prior to the conduct of the questionnaire survey as reported by students ([S6]SQ2a)

Subjects	Percentage (%) of Students choosing the option											
	S2		χ^2 (df=20)	*P*-value	S4		χ^2 (df=20)	*P*-value	S6		χ^2 (df=20)	*P*-value
	MS1 (N=2011)	MS2 (N=1625)			MS1 (N=1690)	MS2 (N=1392)			MS1 (N=1289)	MS2 (N=1120)		
English Language/English Literature	12	14			15	18			20	19		
Chinese Language/Chinese Literature	11	11			12	11			12	18		
Chinese History	9	6			7	8			3	2		
Integrated Science	8	7			0	1			0	0		
Engineering/Design/Electronics/Technology	8	9			4	5			1	1		
Mathematics	4	4			3	4			3	1		
History	4	5			5	3			2	3		
Geography	4	3			8	6			8	5		
Music	4	5			1	2			2	1		
Economics/Public Affairs/Commerce	3	1	55.60	0.000***	5	7	88.67	0.000***	4	7	88.09	0.000***
Liberal Studies	3	4			1	0			2	4		
Art and Design	3	5			2	3			0	1		
Putonghua	2	1			0	0			0	1		
Social Studies/Sociology/Psychology	1	1			1	0			0	0		
Home Economics	1	2			0	0			0	0		
Physical Education	1	1			1	1			0	0		
Physics	0	0			4	4			10	8		
Chemistry	0	1			7	3			13	12		
Biology/Human Biology	0	0			11	9			11	11		
Religious Studies	0	1			1	2			1	1		
Others	19	19			11	12			9	5		

Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

Learning activities in school with the use of IT were mainly confined to information search

Students were asked about the frequency that they were required to use IT in subject-based and cross-curricular project-based learning activities in school (Table 7.17, [S6]SQ4a-e). In MS1, 54% of S2, 48% of S4 and 51% of S6 students frequently or very frequently used computers for "information search". The mean ratings of the item for S2, S4 and S6 students were 3.62 (SD:1.03), 3.50 (SD:1.05) and 3.49 (SD:1.08) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. 33% to 38% of the students (38% of S2, 36% of S4 and 33% of S6) used IT frequently or very

frequently in "reporting and presentation". A relatively lower proportion of the students (24% of S2, 19% of S4 and 13% of S6) reported using IT frequently or very frequently in "self-evaluation on learning outcomes", with mean ratings of 2.83 (SD:1.05), 2.72 (SD:1.00) and 2.40 (SD:1.02) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. A statistically significant increase was noted in the frequency of using IT in "information selection" reported by S2 (from 31% to 35%), "information collation and analysis" reported by S2 (from 30% to 32%) and S4 (from 24% to 28%) and "self-evaluation on learning outcomes" reported by S6 students (from 13% to 14%) in MS2. A decrease was noted in the frequency of using IT in "reporting and presentation" reported by S2 students (from 38% to 35%) in MS2.

A decrease was observed in the percentages of students using digital resources for learning beyond school hours in MS2

Apart from the learning activities in schools, it is worthwhile to know the practice and the kind of digital learning resources that students have made use of beyond school hours. These learning activities allow students to learn independently and to extend their learning opportunities according to their individuals' learning needs and pace. Secondary school students were asked to indicate the frequency in which their teachers' assigned them to use the digital resources to learn subject knowledge beyond school hours. In MS1, 15% to 22% of the respondents (15% of S2, 19% of S4 and 22% of S6) indicated that their teachers did not assign any digital resources for their learning beyond school hours. Nonetheless, 47% of S2, 39% of S4 and 38% of S6 students used digital resources assigned by their teachers (Table 7.18, [S6]SQ10a). Among them, 70% of S2, 67% of S4 and 76% of S6 students were asked to use the designated digital resources 1 to 10 times while 23% of S2, 24% of S4 and 19% of S6 respondents reported that their teachers have assigned digital resources 11 times or more during the week prior to the conduct of the questionnaire survey (Table 7.18, [S6]SQ10b). A statistically significant decrease was noted in the percentages of S2 (from 47% to 38%), S4 (from 39% to 31%) and S6 students (from 38% to 33%) who used digital resources assigned by teachers beyond school hours in MS2.

Other than teachers' assignments, 43% of S2, 41% of S4 and 49% of S6 students took the initiative to make use of digital resources for self-learning beyond school hours (Table 7.18, [S6]SQ11a). Among these students, 68% of S2, 67% of S4 and 71% of S6 students used digital resources 1 to 10 times and 25% of S2, 24% of S4 and 23% of S6 respondents reported that they used digital resources 11 times or more during the week prior to the conduct of the questionnaire survey (Table 7.18, [S6]SQ11b). A statistically significant decrease was noted in the percentages of S2 (from 43% to 32%), S4 (from 41% to 30%) and S6 students (from 49% to 32%) who used digital resources on their own initiative for self-learning beyond school hours in MS2. The frequency of their usage significantly decreased statistically in MS2 (MS1: 23%-25%; and MS2: 10%-15% used the resources 11 times or more).

Table 7.17 Frequency which teachers required students to use IT to accomplish various tasks in learning activities in school ([S6]SQ4a-e)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never										
S2	a.	3.62	1.03	2274	521	(23)	705	(31)	759	(33)	229	(10)	59	(3)	3.65	1.05	1868	475	(25)	542	(29)	628	(34)	168	(9)	56	(3)	0.554
	b.	3.06	1.00	2272	197	(9)	491	(22)	960	(42)	502	(22)	122	(5)	3.15	1.01	1869	181	(10)	467	(25)	773	(41)	341	(18)	107	(6)	0.010*
	c.	3.00	1.02	2271	178	(8)	496	(22)	882	(39)	575	(25)	142	(6)	3.07	1.05	1866	185	(10)	416	(22)	736	(39)	407	(22)	123	(7)	0.045*
	d.	3.21	1.07	2272	311	(14)	536	(24)	862	(38)	444	(20)	119	(5)	3.15	1.09	1866	246	(13)	418	(22)	705	(38)	373	(20)	125	(7)	0.019*
	e.	2.83	1.05	2270	181	(8)	354	(16)	845	(37)	686	(30)	205	(9)	2.88	1.06	1864	153	(8)	316	(17)	701	(38)	531	(28)	162	(9)	0.485
S4	a.	3.50	1.05	2176	441	(20)	616	(28)	784	(36)	256	(12)	79	(4)	3.45	1.13	1806	400	(22)	437	(24)	638	(35)	236	(13)	96	(5)	0.326
	b.	2.98	1.01	2173	171	(8)	407	(19)	948	(44)	492	(23)	154	(7)	2.99	1.06	1805	172	(10)	344	(19)	724	(40)	425	(24)	139	(8)	0.761
	c.	2.89	1.04	2173	177	(8)	356	(16)	859	(40)	609	(28)	172	(8)	2.96	1.09	1806	185	(10)	326	(18)	675	(37)	471	(26)	149	(8)	0.041*
	d.	3.15	1.07	2173	260	(12)	512	(24)	830	(38)	429	(20)	142	(7)	3.18	1.09	1806	247	(14)	411	(23)	672	(37)	370	(21)	106	(6)	0.412
	e.	2.72	1.00	2175	120	(6)	283	(13)	870	(40)	676	(31)	225	(10)	2.80	1.10	1805	166	(9)	248	(14)	664	(37)	520	(29)	207	(11)	0.055
S6	a.	3.49	1.08	1726	338	(20)	535	(31)	566	(33)	208	(12)	79	(5)	3.42	1.12	1431	280	(20)	400	(28)	475	(33)	193	(13)	82	(6)	0.274
	b.	2.91	1.06	1726	134	(8)	333	(19)	660	(38)	434	(25)	166	(10)	2.93	1.06	1430	97	(7)	325	(23)	518	(36)	357	(25)	133	(9)	0.159
	c.	2.77	1.07	1724	116	(7)	275	(16)	638	(37)	484	(28)	211	(12)	2.79	1.07	1431	87	(6)	284	(20)	470	(33)	428	(30)	162	(11)	0.077
	d.	3.04	1.10	1724	176	(10)	401	(23)	628	(36)	361	(21)	158	(9)	3.05	1.12	1436	155	(11)	351	(24)	472	(33)	331	(23)	128	(9)	0.211
	e.	2.40	1.02	1725	69	(4)	154	(9)	506	(29)	671	(39)	325	(19)	2.47	0.99	1431	54	(4)	139	(10)	454	(32)	563	(39)	221	(15)	0.003**

Tasks in learning activities

a. Information search (e.g. using search engine)
b. Information selection
c. Information collation and analysis (e.g. using spreadsheet)
d. Reporting and presentation (e.g. PowerPoint and website presentation)
e. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.18 Frequency of students using digital resources assigned by teachers and on their own initiative for self-learning beyond school hours during the week prior to the conduct of the questionnaire survey ([S6]SQ10a,b,11a,b)

Digital resources which teachers assigned students to use for learning subject knowledge	**Percentage (%) choosing the option**											
	S2			***P*-value**	**S4**			***P*-value**	**S6**			***P*-value**
	MS1 (N=1944)	**MS2 (N=1596)**			**MS1 (N=1592)**	**MS2 (N=1426)**			**MS1 (N=1050)**	**MS2 (N=1159)**		
Yes	47	38		0.000***[a]	39	31		0.000***[a]	38	33		0.043* [a]
No	53	62			61	69			62	67		
Teachers didn't assign any digital resources for learning beyond school hours	15	14			19	21			22	18		
Valid count (N) (excluding no. of students choosing 'Teachers didn't assign any digital resource for learning beyond school hours')												
Frequency	**(N=909)**	**(N=610)**	**$\chi^2_{(df=4)}$**	***P*-value**	**(N=686)**	**(N=446)**	**$\chi^2_{(df=4)}$**	***P*-value**	**(N=508)**	**(N=387)**	**$\chi^2_{(df=4)}$**	***P*-value**
16 times or above	4	6			5	6			2	1		
11 to 15 times	19	5			19	7			17	2		
5 to 10 times	14	16	74.36	0.000*** [b]	16	20	36.15	0.000*** [b]	20	17	64.50	0.000*** [b]
1 to 4 times	56	62			51	55			56	69		
Nil	6	11			9	13			5	11		

Digital resources which students used on their own initiative for self-learning	**Percentage (%) choosing the option**											
	S2			***P*-value**	**S4**			***P*-value**	**S6**			***P*-value**
	MS1 (N=2258)	**MS2 (N=1811)**			**MS1 (N=2158)**	**MS2 (N=1758)**			**MS1 (N=1716)**	**MS2 (N=1398)**		
Yes	43	32		0.000***[a]	41	30		0.000***[a]	49	32		0.000***[a]
No	57	68			59	70			51	68		
Frequency	**(N=977)**	**(N=588)**	**$\chi^2_{(df=4)}$**	***P*-value**	**(N=881)**	**(N=520)**	**$\chi^2_{(df=4)}$**	***P*-value**	**(N=838)**	**(N=453)**	**$\chi^2_{(df=4)}$**	***P*-value**
16 times or above	5	8			5	7			2	4		
11 to 15 times	20	6			19	8			21	6		
5 to 10 times	19	23	63.86	0.000*** [b]	19	24	39.22	0.000*** [b]	19	19	52.00	0.000*** [b]
1 to 4 times	49	57			48	55			52	65		
Nil	7	6			9	6			6	6		

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.]Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

7.1.5 Confidence in the Use of IT to Perform Learning Tasks

Information literacy refers to the mastery of software or hardware skills as well as information-processing skills and attitude towards the use of IT (EMB, 2005a). Mastery of information literacy enables our students to develop necessary generic skills for lifelong learning. They include collaboration skills, communication skills, creativity, critical thinking skills, problem-solving skills, self-management skills, study skills, information skills and numeracy skills. These are the fundamental skills for learning which can be developed through the use of IT in different subjects or key learning areas (KLAs), and are transferable to different learning situations.

School heads tended to be satisfied with student's confidence in using IT for learning

With respect to students' confidence in the use of IT for learning, school heads tended to be satisfied with the items listed in Table 7.19 ([S1]HSQ1c-f). 57% to 66% of school heads were satisfied or very satisfied that students showed the ability to use IT for independent learning, information retrieval and evaluation as well as problem-solving in their daily lives and as a tool in their learning activities in MS1. A statistically significant increase was observed in the percentages of school heads (from 61% to 67%) who rated satisfied or very satisfied with the item of "students can use IT for information retrieval and evaluation of different information sources in their learning activities and to solve problems in their daily lives" in MS2.

Students were generally confident in using IT for computing tasks

Students' levels of confidence in using IT to perform respective computing tasks are shown in Table 7.20 ([S6]SQ19a-j). In MS1, higher proportions of the students rated themselves as confident or very confident in "searching information on the Internet" (70% of S2, 75% of S4 and 79% of S6) and "English input via the computer" (70% of S2, 72% of S4 and 77% of S6). The mean values fell between 3.94 and 3.97 (SD:0.91-0.92) for S2, 4.01-4.02 (SD:0.88-0.89) for S4 and 4.06 (SD:0.85) for S6 on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. 63% to 76% of the students rated themselves as confident or very confident in "using the computer for daily activities such as reading online newspapers" (63% of S2, 69% of S4 and 76% of S6) as well as "using computer to store or retrieve digital resources such as uploading and downloading files" (65% of S2, 71% of S4 and 74% of S6). 48%-58% of S2, 48%-64% of S4 and 47%-64% of S6 students reported themselves to be confident or very confident in other tasks such as "Chinese input", "using the computer for learning" as well as using the Internet or other digital resources to conduct "learning activities assigned by teachers" or "self-learning activities". Among various tasks listed in the table, lower percentages of the students (44% of S2, 43% of S4 and 37% of S6) indicated that they were 'confident' or 'very confident' in "using e-learning platform to conduct learning activities", with a mean rating of 3.37 (SD:1.04), 3.34 (SD:1.00) and 3.21 (SD:1.03) respectively on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'.

In MS2, a statistically significant decrease was noted in the percentages of S2 and S4 students who rated confident or very confident in "Chinese input" (MS1: 58%-64%; MS2: 54%-59%) and "English input" (MS1: 70%-72%; MS2: 65%-66%) as well as "using computers to conduct entertaining activities" (MS1: both 72%; MS2: both 66%). A statistically significant decrease was also noted in the percentages of S4 students who rated confident or very confident in "using the computer for daily activities" (from 69% to 66%), "using the computer to store/retrieve digital resources" (from 71% to 65%) and "searching information on the Internet" (from 75% to 68%). However, a statistically significant increase was observed in the percentage of S6 students who rated confident or very

confident in "using the Internet/other digital resources to conduct learning activities assigned by teachers" (from 47% to 51%).

Students were confident in information search

Students were asked about their levels of confidence in using IT to perform different learning tasks (Table 7.21, [S6]SQ14a.i-v). In MS1, 69% of S2, 69% of S4 and 74% of S6 students rated themselves as confident or very confident in "information search". Around 50% of the students rated themselves as confident or very confident in "information selection" (50% of S2, 51% of S4 and 52% of S6) as well as in "information collation and analysis" (48% of S2, 46% of S4 and 51% of S6). 54% or less of the students rated themselves as confident or very confident in "reporting and presentation" (51% of S2, 53% of S4 and 54% of S6) as well as "self-evaluation on learning outcomes" (47% of S2, 44% of S4 and 42% of S6). The ranges of mean values were 3.48-3.89 (SD: 0.86-0.94) for S2, 3.44-3.88 (SD:0.84-0.91) for S4 and 3.50-3.92 (SD:0.80-0.91) for S6 students on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. In MS2, there was a statistically significant decrease in the percentage of S2 students who rated confident or very confident in "reporting and presentation" (from 51% to 49%). However, a statistically significant increase was noted in the percentages of the S6 students who rated confident or very confident in "information search" (from 74% to 77%) and "information selection" (from 52% to 57%).

Parents generally agreed on students' capability of using IT for learning, especially in information search

Parents' views on the students' capability in performing stated learning tasks with the use of IT are examined. In MS1, 81% and 60% of the surveyed parents agreed and strongly agreed that their children were capable of using IT in "information search" and "information selection" respectively. 47% to 55% of the parents agreed or strongly agreed that their children were capable of using IT to perform the tasks in "information collation and analysis" (51%), "reporting and presentation" (55%) as well as "self-evaluation on learning outcomes" (47%). The mean values fell in the range of 3.42 to 4.02 (SD:0.68-0.80) on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. A statistically significant decrease was observed in the proportions of parents reported agreed or strongly agreed that their children were capable of using IT in "information search" (from 81% to 79%) and "reporting and presentation" (from 55% to 53%) in MS2 (Table 7.22, [S7]PQ4a-e).

Table 7.19 School heads' levels of satisfaction with students' confidence in using IT for learning ([S1]HSQ1c-f)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied									
c	3.63	0.63	397	19	(5)	223	(56)	143	(36)	12 (3)	0	(0)	3.76	0.63	354	33	(9)	207	(58)	109	(31)	5 (1)	0 (0)	0.009**
d	3.57	0.68	397	22	(6)	204	(51)	150	(38)	21 (5)	0	(0)	3.67	0.69	354	34	(10)	180	(51)	129	(36)	11 (3)	0 (0)	0.093
e	3.70	0.61	397	23	(6)	240	(60)	126	(32)	8 (2)	0	(0)	3.78	0.60	354	31	(9)	218	(62)	102	(29)	3 (1)	0 (0)	0.093
f	3.61	0.66	397	28	(7)	197	(50)	162	(41)	10 (3)	0	(0)	3.64	0.67	354	25	(7)	187	(53)	131	(37)	10 (3)	1 (0)	0.485

Aspects related to students' use of IT in learning

c. Students can use IT for information retrieval and evaluation of different information sources in their learning activities and to solve problems in their daily lives.

d. Students show the ability to learn independently and to widen their views by using digital resources in their learning activities according to their individual learning needs and pace.

e. Students can select appropriate IT tool(s) to conduct their learning and to solve problems in their daily lives.

f. Students show the ability to use IT as a productivity tool, a communication tool, a collaboration tool, a research tool and a decision-making tool in their learning activities.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.20 Students' self-perceived levels of confidence in using IT to perform related computing tasks ([S6]SQ19a-j)

Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident											
S2	a.	3.66	1.07	2268	552	(24)	777	(34)	672	(30)	160	(7)	107	(5)	3.56	1.07	1841	381	(21)	613	(33)	600	(33)	144	(8)	103	(6)	0.002 **
	b.	3.97	0.92	2269	751	(33)	842	(37)	579	(26)	61	(3)	36	(2)	3.86	0.96	1842	539	(29)	658	(36)	532	(29)	68	(4)	44	(2)	0.000 ***
	c.	3.51	0.92	2267	352	(16)	723	(32)	989	(44)	138	(6)	64	(3)	3.52	0.95	1840	310	(17)	562	(31)	798	(43)	110	(6)	61	(3)	0.981
	d.	4.04	0.93	2269	848	(37)	783	(35)	545	(24)	54	(2)	38	(2)	3.94	0.97	1841	631	(34)	596	(32)	522	(28)	49	(3)	43	(2)	0.002 **
	e.	3.79	0.92	2266	547	(24)	886	(39)	700	(31)	86	(4)	47	(2)	3.79	0.96	1843	481	(26)	662	(36)	575	(31)	82	(4)	43	(2)	0.961
	f.	3.85	0.96	2264	654	(29)	815	(36)	656	(29)	88	(4)	51	(2)	3.83	0.97	1839	534	(29)	615	(33)	567	(31)	83	(5)	41	(2)	0.389
	g.	3.94	0.91	2265	703	(31)	873	(39)	587	(26)	66	(3)	37	(2)	3.92	0.93	1833	572	(31)	667	(36)	503	(27)	59	(3)	32	(2)	0.625
	h.	3.52	0.94	2263	352	(16)	759	(34)	940	(42)	137	(6)	75	(3)	3.49	0.95	1827	297	(16)	541	(30)	809	(44)	122	(7)	58	(3)	0.134
	i.	3.52	0.93	2266	343	(15)	785	(35)	930	(41)	133	(6)	75	(3)	3.49	0.96	1841	295	(16)	572	(31)	793	(43)	112	(6)	70	(4)	0.132
	j.	3.37	1.04	2254	323	(14)	682	(30)	909	(40)	191	(8)	149	(7)	3.35	1.02	1834	246	(13)	542	(30)	766	(42)	172	(9)	108	(6)	0.170
S4	a.	3.75	1.04	2175	559	(26)	826	(38)	560	(26)	142	(7)	88	(4)	3.68	1.04	1795	421	(23)	648	(36)	534	(30)	110	(6)	82	(5)	0.009 **
	b.	4.01	0.89	2171	736	(34)	831	(38)	513	(24)	66	(3)	24	(1)	3.87	0.95	1794	526	(29)	665	(37)	491	(27)	76	(4)	36	(2)	0.000 ***
	c.	3.58	0.91	2169	365	(17)	755	(35)	877	(40)	125	(6)	46	(2)	3.53	0.93	1791	299	(17)	560	(31)	765	(43)	126	(7)	41	(2)	0.051
	d.	4.01	0.93	2174	781	(36)	782	(36)	509	(23)	67	(3)	35	(2)	3.91	0.97	1793	591	(33)	590	(33)	507	(28)	70	(4)	35	(2)	0.000 ***
	e.	3.94	0.92	2175	677	(31)	837	(38)	554	(25)	69	(3)	38	(2)	3.86	0.94	1790	513	(29)	654	(37)	522	(29)	67	(4)	33	(2)	0.004 **
	f.	3.97	0.93	2171	713	(33)	823	(38)	527	(24)	68	(3)	41	(2)	3.89	0.94	1793	546	(30)	633	(35)	520	(29)	63	(4)	31	(2)	0.001 **
	g.	4.02	0.88	2176	710	(33)	919	(42)	460	(21)	51	(2)	36	(2)	3.94	0.91	1790	561	(31)	670	(37)	485	(27)	45	(3)	29	(2)	0.001 **
	h.	3.54	0.90	2170	323	(15)	763	(35)	895	(41)	143	(7)	46	(2)	3.53	0.91	1788	282	(16)	580	(32)	782	(44)	100	(6)	46	(3)	0.495
	i.	3.51	0.91	2170	314	(14)	736	(34)	925	(43)	135	(6)	61	(3)	3.51	0.91	1794	264	(15)	594	(33)	775	(43)	112	(6)	49	(3)	0.728
	j.	3.34	1.00	2162	266	(12)	663	(31)	895	(41)	219	(10)	119	(6)	3.37	1.00	1790	251	(14)	496	(28)	803	(45)	142	(8)	98	(5)	0.586
S6	a.	3.74	1.00	1725	399	(23)	706	(41)	440	(26)	124	(7)	56	(3)	3.72	1.02	1417	334	(24)	554	(39)	382	(27)	91	(6)	56	(4)	0.606
	b.	4.06	0.85	1725	584	(34)	736	(43)	341	(20)	49	(3)	16	(1)	4.02	0.86	1419	462	(33)	582	(41)	329	(23)	32	(2)	14	(1)	0.073
	c.	3.62	0.94	1722	314	(18)	640	(37)	606	(35)	123	(7)	38	(2)	3.65	0.92	1417	270	(19)	526	(37)	507	(36)	84	(6)	29	(2)	0.418
	d.	4.01	0.92	1720	591	(34)	665	(39)	381	(22)	53	(3)	30	(2)	4.02	0.91	1416	490	(35)	550	(39)	315	(22)	40	(3)	23	(2)	0.977
	e.	4.01	0.86	1723	527	(31)	767	(45)	363	(21)	45	(3)	21	(1)	4.03	0.86	1416	464	(33)	588	(42)	315	(22)	34	(2)	15	(1)	0.718
	f.	3.99	0.90	1723	542	(31)	742	(43)	350	(20)	63	(4)	26	(2)	4.04	0.86	1417	475	(34)	583	(41)	311	(22)	36	(3)	13	(1)	0.462
	g.	4.06	0.85	1724	562	(33)	793	(46)	299	(17)	48	(3)	22	(1)	4.11	0.82	1417	490	(35)	635	(45)	257	(18)	21	(2)	14	(1)	0.289
	h.	3.50	0.90	1721	226	(13)	619	(36)	700	(41)	135	(8)	41	(2)	3.56	0.92	1418	216	(15)	528	(37)	538	(38)	102	(7)	34	(2)	0.051
	i.	3.45	0.90	1720	207	(12)	595	(35)	736	(43)	133	(8)	49	(3)	3.51	0.93	1417	196	(14)	521	(37)	558	(39)	97	(7)	46	(3)	0.024 *
	j.	3.21	1.03	1717	175	(10)	469	(27)	735	(43)	208	(12)	129	(8)	3.25	1.03	1414	152	(11)	408	(29)	597	(42)	150	(11)	107	(8)	0.139

Tasks

a. Chinese input via the computer
b. English input via the computer
c. Using the computer for learning (e.g. browsing electronic books)
d. Using computer to conduct entertaining activities (e.g. playing computer games)
e. Using the computer for daily activities (e.g. reading online newspapers)
f. Using the computer to store/retrieve digital resources (e.g. uploading and downloading files)
g. Searching information on the Internet
h. Using the Internet/other digital resources to conduct self-learning activities
i. Using the Internet/other digital resources to conduct learning activities assigned by teachers
j. Using e-learning platform[#] to conduct learning activities (e.g. browsing documents, submitting assignments and after school discussion)

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

Table 7.21 Students' self-perceived levels of confidence in using IT to perform different tasks ([S6]SQ14a.i-iv)

Class levels		MS1 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident	MS2 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident	*P*-value
S2	i.	3.89	0.88	2257	605 (27)	939 (42)	629 (28)	41 (2)	44 (2)	3.91	0.87	1838	497 (27)	779 (42)	492 (27)	44 (2)	26 (1)	0.948
	ii.	3.54	0.86	2255	298 (13)	830 (37)	969 (43)	112 (5)	46 (2)	3.56	0.86	1835	264 (14)	655 (36)	793 (43)	90 (5)	33 (2)	0.977
	iii.	3.50	0.88	2255	289 (13)	794 (35)	980 (43)	135 (6)	57 (3)	3.51	0.90	1832	263 (14)	617 (34)	786 (43)	121 (7)	45 (2)	0.884
	iv.	3.56	0.94	2254	383 (17)	766 (34)	898 (40)	141 (6)	66 (3)	3.50	0.97	1829	296 (16)	600 (33)	724 (40)	142 (8)	67 (4)	0.012 *
	v.	3.48	0.90	2249	305 (14)	735 (33)	101 (45)	133 (6)	65 (3)	3.47	0.94	1825	265 (15)	571 (31)	815 (45)	107 (6)	66 (4)	0.337
S4	i.	3.88	0.84	2160	514 (24)	975 (45)	601 (28)	37 (2)	33 (2)	3.86	0.84	1787	395 (22)	832 (47)	498 (28)	35 (2)	28 (2)	0.233
	ii.	3.54	0.84	2158	270 (13)	813 (38)	934 (43)	104 (5)	39 (2)	3.56	0.82	1779	224 (13)	667 (38)	795 (45)	60 (3)	32 (2)	0.782
	iii.	3.48	0.86	2156	257 (12)	741 (34)	979 (45)	139 (6)	41 (2)	3.53	0.86	1786	242 (14)	622 (35)	795 (44)	93 (5)	35 (2)	0.077
	iv.	3.56	0.91	2162	323 (15)	814 (38)	828 (38)	147 (7)	51 (2)	3.54	0.92	1784	271 (15)	623 (35)	724 (41)	121 (7)	45 (3)	0.291
	v.	3.44	0.87	2154	245 (11)	720 (33)	998 (46)	131 (6)	61 (3)	3.45	0.88	1786	213 (12)	583 (33)	827 (46)	120 (7)	44 (2)	0.890
S6	i.	3.92	0.80	1721	387 (22)	901 (52)	371 (22)	40 (2)	22 (1)	4.00	0.80	1415	385 (27)	709 (50)	278 (20)	30 (2)	13 (1)	0.004**
	ii.	3.56	0.83	1719	206 (12)	692 (40)	708 (41)	83 (5)	30 (2)	3.63	0.80	1414	181 (13)	629 (44)	522 (37)	67 (5)	14 (1)	0.006**
	iii.	3.50	0.86	1722	181 (11)	696 (40)	679 (39)	128 (7)	37 (2)	3.50	0.85	1415	163 (11)	534 (38)	587 (41)	112 (8)	20 (1)	0.898
	iv.	3.57	0.91	1721	255 (15)	680 (39)	615 (36)	133 (8)	38 (2)	3.57	0.90	1415	209 (15)	559 (40)	506 (36)	114 (8)	26 (2)	0.575
	v.	3.38	0.88	1719	171 (10)	558 (32)	790 (46)	158 (9)	42 (2)	3.37	0.89	1412	148 (10)	438 (31)	658 (47)	129 (9)	40 (3)	0.952

Tasks

i. Information search (e.g. using search engine)
ii. Information selection
iii. Information collation and analysis (e.g. using spreadsheet)
iv. Reporting and Presentation (e.g. PowerPoint and website presentation)
v. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)
Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.22 Parents' levels of agreement on students' capability of using IT to perform different tasks ([S7]PQ4a-e)

	MS1 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Strongly agree	Agree	Neutral (一般)	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Strongly agree	Agree	Neutral (一般)	Disagree	Strongly disagree	*P*-value
a.	4.02	0.68	5783	1293 (22)	3398 (59)	1029 (18)	49 (1)	14 (0)	3.98	0.69	4199	875 (21)	2421 (58)	843 (20)	51 (1)	9 (0)	0.002 **
b.	3.66	0.71	5594	554 (10)	2788 (50)	2059 (37)	170 (3)	23 (0)	3.64	0.71	4090	398 (10)	2001 (49)	1539 (38)	142 (3)	11 (0)	0.192
c.	3.52	0.77	5546	498 (9)	2344 (42)	2310 (42)	356 (6)	37 (1)	3.50	0.78	4050	338 (8)	1697 (42)	1699 (42)	282 (7)	34 (1)	0.091
d.	3.58	0.80	5525	600 (11)	2455 (44)	2060 (37)	360 (7)	50 (1)	3.54	0.80	4021	391 (10)	1739 (43)	1560 (39)	302 (8)	29 (1)	0.002 **
e.	3.42	0.80	5374	404 (8)	2070 (39)	2367 (44)	465 (9)	68 (1)	3.41	0.81	3922	280 (7)	1524 (39)	1702 (43)	359 (9)	57 (1)	0.385

Tasks

a. Information search (e.g. using search engine)
b. Information selection
c. Information collation and analysis (e.g. using spreadsheet)
d. Reporting and Presentation (e.g. PowerPoint and website presentation)
e. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)
Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers perceived that students were quite confident (一般) in using IT to complete different learning tasks and solve problems in real-life situations

The confidence level of students in using IT to complete different learning tasks and solve problems in real-life situations is reported by teachers. In MS1, 24% of the teachers thought that their students were confident or very confident in using IT to complete different learning tasks and solve real-life problems with the use of IT, with a mean rating of 3.13 (SD:0.61) on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident' No statistically significant difference was reported in MS2 (Table 7.23, [S5]TQ19c).

Table 7.23 Teachers' perception of students' levels of confidence in using IT to complete different learning tasks and solve problems in real-life situations ([S5]TQ19c)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident	
Level of confidence of students in using IT to complete different learning tasks and solve problems in real life situations									
MS1	3.13	0.61	2704	17 (1)	622 (23)	1768 (65)	277 (10)	20 (1)	0.077
MS2	3.09	0.63	2010	16 (1)	433 (22)	1303 (65)	237 (12)	21 (1)	

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.1.6 Learning Support

S4 and S6 students mainly learnt to use software and hardware from their classmates or friends while S2 students mainly learnt to use the software and hardware from their parents or relatives

Students need support from schools, homes and other sources in their learning of IT. The main channel from which S4 (30%) and S6 students (33%) fully or mostly learnt software and hardware skills in MS1 was from their classmates or friends, while the main channel of support for S2 students was from their parents or relatives (36%). It was noticed that students at higher levels were less dependent on their parents or relatives (36% of S2, 27% of S4 and 25% of S6) and the Computer or IT curriculum in school (26% of S2, 23% of S4 and 16% of S6) for learning software and hardware. 14% or less of the students (14% of S2, 9% of S4 and 6% of S6) indicated that they fully or mostly learnt those skills from training activities organised by outside school organisations. In MS2, a statistically significant increase was noted in the frequency of S2 (from 26% to 28% choosing fully or mostly) and S6 (from 39% to 43% choosing partly) in learning software and hardware from the channel of "Computer/IT curriculum in school". There was a statistically significant increase in that of S4 students (from 14% to 18% choosing fully or mostly) from the channel of "Computer/IT-related extra-curricular activities in school" (Table 7.24, [S6]SQ18a-e).

Students perceived the learning support from teachers to be quite sufficient (一般) while teachers indicated occasional provision of learning support for students

Table 7.25 shows the frequency and sufficiency levels of learning support that students received from teachers. It was shown in MS1 that students at higher school levels obtained less support from their teachers as compared with their counterparts of lower levels [28%, 25% and 23% of S2, S4 and S6 students respectively obtained support from teachers frequently or very frequently when they encountered difficulties in performing the learning activities with the use of IT, with mean ratings of 3.06 (SD:0.89), 3.00 (SD:0.88) and 2.85 (SD:0.95) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'] ([S6]SQ14b). A slightly lower proportion of the teachers (20%) indicated that they frequently or very frequently provided learning support for their students when using IT, with a mean rating of 2.88 (SD:0.83) on a scale of 1 to 5 where 1 was 'never' and 5 was

'very frequently' ([S5]TQ14b). A statistically significant increase was noted in the frequency level of teachers providing such support in MS2 (from 20% to 22%). There was also a statistically significant increase in the percentage of S2 students receiving such support in MS2 (from 28% to 31%).

Regarding the sufficiency of learning support received from teachers, 33% of S2, 28% of S4 and 25% of S6 students in MS1 considered the support from teachers as sufficient or very sufficient whereas 20%, 19% and 28% of them rated it as insufficient or totally insufficient, with mean ratings of 3.13 (SD:0.92), 3.09 (SD:0.85) and 2.96 (SD:0.91) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant increase was observed in the percentages of students (MS1: 25%-33%; MS2: 28%-42%) rating it as sufficient or very sufficient to the learning support received from teachers in MS2 (Table 7.25, [S6]SQ14c)

Table 7.24 The channel(s) from which students learnt the software and hardware skills ([S6]SQ18a-e)

Class levels		MS1 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Fully	Mostly	Partly	Rarely	None	MS2 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Fully	Mostly	Partly	Rarely	None	*P*-value
S2	a.	3.06	0.97	2258	154 (7)	528 (23)	1038 (46)	385 (17)	154 (7)	3.05	1.03	1823	144 (8)	411 (23)	830 (46)	264 (14)	173 (9)	0.993
	b.	2.88	0.98	2251	103 (5)	466 (21)	992 (44)	432 (19)	257 (11)	2.94	1.02	1820	118 (7)	382 (21)	791 (43)	327 (18)	203 (11)	0.048*
	c.	2.69	1.05	2248	93 (4)	352 (16)	933 (42)	497 (22)	374 (17)	2.73	1.10	1820	109 (6)	290 (16)	712 (39)	413 (23)	296 (16)	0.389
	d.	3.03	1.14	2256	215 (10)	594 (26)	775 (34)	395 (17)	277 (12)	3.01	1.17	1825	178 (10)	461 (25)	638 (35)	290 (16)	257 (14)	0.498
	e.	2.23	1.15	2246	82 (4)	217 (10)	653 (29)	479 (21)	816 (36)	2.30	1.23	1821	101 (6)	192 (11)	547 (30)	301 (17)	680 (37)	0.233
S4	a.	3.06	0.93	2165	105 (5)	541 (25)	1033 (48)	347 (16)	138 (6)	3.07	0.98	1785	123 (7)	422 (24)	836 (47)	267 (15)	136 (8)	0.703
	b.	2.82	0.98	2155	64 (3)	429 (20)	964 (45)	452 (21)	246 (11)	2.83	1.02	1783	88 (5)	317 (18)	798 (45)	357 (20)	223 (13)	0.809
	c.	2.50	1.00	2155	54 (3)	235 (11)	856 (40)	597 (28)	413 (19)	2.59	1.09	1774	85 (5)	232 (13)	695 (39)	400 (23)	362 (20)	0.005 **
	d.	2.77	1.14	2162	125 (6)	462 (21)	757 (35)	430 (20)	389 (18)	2.80	1.16	1782	118 (7)	388 (22)	622 (35)	337 (19)	318 (18)	0.315
	e.	2.10	1.09	2154	57 (3)	140 (6)	631 (29)	460 (21)	866 (40)	2.18	1.17	1773	71 (4)	156 (9)	506 (29)	323 (18)	717 (40)	0.055
S6	a.	3.10	0.90	1719	62 (4)	501 (29)	794 (46)	261 (15)	100 (6)	3.09	0.92	1408	49 (4)	424 (30)	648 (46)	184 (13)	103 (7)	0.937
	b.	2.54	0.99	1713	28 (2)	235 (14)	670 (39)	481 (28)	300 (17)	2.62	0.97	1406	25 (2)	199 (14)	611 (43)	354 (25)	217 (15)	0.007 **
	c.	2.22	1.00	1716	28 (2)	134 (8)	520 (30)	544 (32)	490 (29)	2.22	1.01	1403	21 (2)	115 (8)	430 (31)	422 (30)	414 (30)	0.906
	d.	2.69	1.13	1718	76 (4)	359 (21)	554 (32)	406 (24)	322 (19)	2.61	1.15	1408	54 (4)	274 (19)	473 (34)	286 (20)	321 (23)	0.125
	e.	1.88	1.01	1716	24 (1)	90 (5)	367 (21)	408 (24)	827 (48)	1.92	1.04	1405	24 (2)	95 (7)	279 (20)	354 (25)	653 (46)	0.316

Channels which students learnt to use software/hardware

a. Fellow students/Friends *b. Computer/IT curriculum in school*

c. Computer/IT-related extra-curricular activities in school *d. Parents/Relatives*

e. Training activities organised by outside school organisations (e.g. computer companies and community centres)

Mean: 1= "None" and 5="Fully"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.25 The frequency in which teachers give learning support for students when they encounter difficulties in performing the learning activities with the use of IT and students' levels of sufficiency to such support from teachers ([S6]SQ14b,c, [S5]TQ14b)

Class levels	MS1 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	MS2 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	*P*-value
Level of frequency	(Mean: 1="Never" and 5="Very frequently")																
S2	3.06	0.89	2261	116 (5)	512 (23)	1142 (51)	376 (17)	114 (5)	3.15	0.91	1834	125 (7)	447 (24)	923 (50)	250 (14)	89 (5)	0.000 ***
S4	3.00	0.88	2167	103 (5)	431 (20)	1102 (51)	426 (20)	105 (5)	3.01	0.91	1788	79 (4)	399 (22)	893 (50)	301 (17)	116 (7)	0.300
S6	2.85	0.95	1719	78 (5)	307 (18)	732 (43)	475 (28)	127 (7)	2.79	0.92	1415	28 (2)	255 (18)	673 (48)	317 (22)	143 (10)	0.448
Teachers	2.88	0.83	2727	68 (3)	457 (17)	1374 (51)	665 (25)	119 (4)	2.95	0.83	1986	60 (3)	381 (19)	1026 (52)	437 (22)	82 (4)	0.006 **

Class levels	MS1 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally insufficient	MS2 Mean (1-5)	SD	N	Count (%) of Students choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally insufficient	*P*-value
Level of sufficiency	(Mean: 1="Totally insufficient" and 5="Very sufficient")																
S2	3.13	0.92	2252	124 (6)	618 (27)	1067 (47)	317 (14)	126 (6)	3.32	0.89	1828	135 (7)	636 (35)	800 (44)	190 (10)	67 (4)	0.000 ***
S4	3.09	0.85	2164	99 (5)	507 (23)	1141 (53)	328 (15)	88 (4)	3.16	0.91	1785	96 (5)	514 (29)	846 (47)	236 (13)	93 (5)	0.002 **
S6	2.96	0.91	1715	76 (4)	357 (21)	807 (47)	375 (22)	100 (6)	3.00	0.89	1410	28 (2)	363 (26)	697 (49)	220 (16)	102 (7)	0.013 *

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.1.7 School ITEd Curriculum

School heads tended to be very satisfied that students were given the opportunities to learn about IT knowledge and skills

Table 7.26 ([S1]HSQ3a,c) showed that school heads were satisfied with the provision of school ITEd curriculum which helped to develop students' IT skills and to foster the development of information literacy and generic skills through the application of such skills in learning activities across the KLAs. In MS1, nearly all of school heads (98%) were satisfied or very satisfied that students were "given the opportunities to learn about IT knowledge and skills", with a mean rating of 4.32 (SD:0.52). 83% of them were also satisfied or very satisfied that the school curriculum provided "a learning context for students to use IT to acquire learning resources and also as a tool for learning, solving problems and sharing their achievements" , with a mean rating of 3.96 (SD:0.60) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. There was no statistically significant difference for these two aspects in MS2.

80% of schools offered Computer or IT subjects — schools followed closely the guidelines of Information Technology Learning Targets in school IT curriculum

School IT curriculum refers to the learning experiences set out in the Information Technology Learning Targets. 80% of secondary schools offered Computer or IT subjects in both MS1 and MS2 ([S3]ITEdInfoQ7a). The contents of Computer or IT curriculum in secondary schools were surveyed by the School ITEd Survey (Table 7.27, [S3]ITEdInfoQ8a-c). The findings showed that secondary schools closely followed the guidelines of Information Technology Learning Targets (CDC, 2000)[13] in preparing learning and teaching activities to develop students' capability in using IT. Information-processing skills and presentation skills were expected to be developed in lower secondary levels. Awareness of the legal, social and ethical responsibilities in using IT was also emphasized in this stage.

As for the software taught in Computer or IT subject in MS1, "word processing software" (97%), "Chinese input" (90%), "online communication software" (83%), "online information searching tools" (81%) and "presentation software" (63%) were taught mainly in S1 while "spreadsheet" was taught mainly in S2 (73%). "Web design or editing software" was taught mainly in S2 (60%) and S3 (59%). "Computer graphic design" was mainly taught in S1 (48%) and S2 (60%). "Multi-media design" was mainly taught in S2 (43%) and S3 (62%). "Programming" (43%) and "audio or video editing software" (36%) were mainly taught in S3. 46% and 49% of the secondary schools did not include "programming" as well as "audio or video editing software" in the curriculum respectively (Table 7.27, [S3]ITEdInfoQ8a).

As far as the teaching of hardware skills in Computer or IT subject was concerned in MS1, the use of "printer", "CD-ROM writer" and "keyboard" were mainly taught in S1 (75%, 49% and 85% respectively). "Digital camera" was mainly taught in S2 (43%). The operation of "scanner" was mainly taught in S1 and S2 (36% for both S1 and S2). "Network devices" was mainly taught in S3 (44%). 43% to 65% of the secondary schools did not teach how to use "digital video recorder" (43%),

[13] Students at Stage III (S1 to S3) are expected to improve their effectiveness in applying IT tools in learning, develop capability to process and present information as well as to verify the accuracy and reliability of information with the awareness of the legal, social and ethical responsibilities.

"mobile devices" (65%) and "network devices" (45%) in the curriculum (Table 7.27, [S3]ITEdInfoQ8b).

Regarding the contents related to information literacy skills taught in Computer or IT curriculum, as reported in MS1, "information search" (89%) and "information selection" (59%) were mainly taught in S1. "Information collation and analysis" (61%) was mainly taught in S2. "Reporting and presentation" was mainly taught in S1 (51%) and S2 (65%). "Intellectual property awareness" (58% for S1 and 59% for S3), "personal data privacy awareness" (53% for S1 and 56% of S3) and "proper use of IT such as Internet security" (63% for S1 and 57% for S3) were mainly taught in S1 and S3 (Table 7.27, [S3]ITEdInfoQ8c).

A statistically significant increase was observed in the percentages of schools which taught the use of the following software and hardware in the Computer/IT curriculum of S2 in MS2: "audio or video editing software" (from 18% to 26%) and "network devices" (from 11% to 16%). A statistically significant decrease was noted in the percentages of schools which taught the use of "computer graphic design" (from 39% to 28%), "printer" (from 15% to 10%) and "CD-Rom writer" (from 19% to 11%) at S3 in MS2. A statistically significant increase was also observed in the percentages of schools which taught the following contents related to the correct attitude of using IT in Computer/IT curriculum in MS2: "intellectual property awareness" (from 58% to 66%) at S1; "personal data privacy awareness" at S1 (from 53% to 63%) and S2 (from 38% to 47%); as well as "proper use of IT" at S1 (from 63% to 70%) and S2 (from 44% to 54%).

Table 7.26 School heads' levels of satisfaction with the opportunities given to students' use of IT in learning ([S1]HSQ3a,c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied	
a	4.32	0.52	397	139	(35)	249	(63)	8	(2)	1 (0)	4.32	0.57	354	130	(37)	208	(59)	15	(4)	1 (0)	0.953
c	3.96	0.60	397	58	(15)	270	(68)	64	(16)	5 (1)	3.99	0.58	354	56	(16)	240	(68)	56	(16)	2 (1)	0.574

Aspects related to students' use of IT in learning

a. Students are given the opportunities to learn about IT knowledge and skills.

c. The school curriculum provides a learning context for students to use IT to acquire learning resources and also as a tool for learning, solving problems and sharing their achievements.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.27 Contents of Computer/IT curriculum in teaching software, hardware and information literacy ([S3]ITEdInfoQ8a-c)

Contents of Computer/IT curriculum	Percentage (%) choosing the options								*P*-value			
	MS1				MS2							
	S1	S2	S3	Not being taught in special school	S1	S2	S3	Not being taught in special school	S1	S2	S3	Not being taught in special school
	(N=309)				(N=280)							
Software												
i. Word processing software	97	21	9	2	95	21	7	4	0.348	0.880	0.312	0.484
ii. Spreadsheet	35	73	17	3	42	72	16	3	0.057	0.750	0.781	0.139
iii. Presentation software	63	50	15	2	63	51	12	3	0.765	0.442	0.324	0.376
iv. Online communication software (e.g. E-mail)	83	26	28	4	78	29	26	6	0.417	0.385	0.895	1.000
v. Online information searching tools (e.g. browser and search engine)	81	28	24	4	80	35	25	5	0.684	0.053	0.666	0.542
vi. Web design/editing software	24	60	59	2	24	61	56	4	0.885	0.631	0.403	0.892
vii. Computer graphic design (e.g. drawing and photo editing)	48	60	39	5	50	57	28	4	0.638	0.758	0.005**	0.117
viii. Multi-media design (e.g. animation design)	9	43	62	12	8	45	57	12	0.741	0.267	0.149	0.576
ix. Programming (e.g. Logo and Java)	16	21	43	46	12	18	36	53	0.225	0.368	0.234	0.325
x. Audio/Video editing software (e.g. editing and file format conversion)	4	18	36	49	6	26	39	40	0.100	0.014*	0.431	0.010*
xi. Chinese input	90	22	11	6	90	22	9	7	0.630	0.992	0.373	0.949
Hardware												
i. Printer (打印機)	75	31	15	13	74	28	10	14	0.730	0.544	0.039*	0.465
ii. CD-ROM (CD-R or DVD-R) Writer (光碟機/光碟燒錄機)	49	31	19	26	51	34	11	25	0.457	0.358	0.033*	0.167
iii. Digital Camera (數碼相機)	33	43	21	27	32	41	17	30	0.901	0.920	0.225	0.856
iv. Digital Video Recorder (數碼攝錄機)	17	29	25	43	20	33	25	39	0.445	0.120	0.946	0.132
v. Scanner (掃描器)	36	36	19	29	38	38	13	30	0.712	0.644	0.077	0.726
vi. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)])	13	14	18	65	17	16	18	61	0.095	0.161	0.957	0.114
vii. Network Devices (e.g. Domestic Network Devices)	9	11	44	45	13	16	45	40	0.121	0.022*	0.600	0.062
viii. Use of Keyboard	85	15	11	13	83	13	8	16	0.957	0.764	0.209	0.991
Information Literacy												
i. Information search	89	41	32	3	88	45	34	1	0.453	0.329	0.574	0.007**
ii. Information selection	59	50	38	10	59	54	39	6	0.795	0.186	0.919	0.014*
iii. Information collation and analysis	40	61	46	11	47	60	42	9	0.134	0.966	0.474	0.134
iv. Reporting and Presentation	51	65	49	7	55	62	44	7	0.309	0.532	0.471	0.368
v. Intellectual Property Awareness	58	41	59	7	66	50	55	6	0.042*	0.062	0.647	0.106
vi. Personal Data Privacy Awareness	53	38	56	13	63	47	55	9	0.034*	0.049*	0.927	0.042*
vii. Proper use of IT (e.g. Internet security)	63	44	57	8	70	54	56	5	0.037*	0.011*	0.678	0.034*

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.2 Empowering Teachers with IT

The second strategic goal is "Empowering teachers with IT". The purpose is to enable teachers to make good pedagogical use of IT so as to stimulate students' thinking or facilitate students to construct their own knowledge. To track the progress of this goal, the following aspects related to teachers' use of IT in teaching are examined:

- Teachers' IT competency
- Perceived application of IT in teaching
- Belief and attitude towards using IT for learning and teaching
- Teaching with IT
- Confidence in using IT for learning and teaching
- School professional development in ITEd for teachers
- School ITEd sharing and collaboration among teachers
- Areas for improvement of ITEd development

7.2.1 Teachers' IT Competency

School heads were satisfied with teachers' IT competency

Teachers should acquire adequate IT competency in order to use IT in conducting administrative and teaching duties. 92% of school heads were satisfied or very satisfied with teachers' IT competency in MS1. No statistically significant difference was found in MS2 (Table 7.28, [S1]HSQ2a)

Table 7.28 School heads' levels of satisfaction with teachers' IT competency ([S1]HSQ2a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Teachers' IT competency meets the requirements of Education and Manpower Bureau."									
MS1	4.19	0.59	397	109 (27)	260 (65)	25 (6)	2 (1)	1 (0)	0.315
MS2	4.16	0.57	354	89 (25)	233 (66)	31 (9)	1 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers were generally proficient in software and hardware skills

When looking at teachers' self-evaluated proficiency in terms of software skills, as reported in MS1, 71% to 84% of the teachers thought that they were proficient or highly proficient in using software such as "word processing software" (84%), "online communication software" (76%), "online information searching tools" (76%) and "presentation software" (71%). 57% and 50% of them thought that they were proficient or highly proficient in using "spreadsheet" and "Chinese input" respectively. Teachers' competency in using more advanced tools: "computer graphic design" (27%), "web design or editing software" (24%), "audio or video editing software" (18%) and "multi-media design software" (15%) were all relatively low, with 15% to 27% of the teachers rated themselves as proficient or highly proficient. The software with the lowest proportion of the surveyed teachers rated themselves as proficient or highly proficient users was "programming" (10%). A statistically significant increase was noted in the percentages of the teachers rating themselves as proficient or highly proficient in using "spreadsheet" (from 57% to 61%), "multi-media design software" (from 15% to 16%), "programming" (from 10% to 13%), "audio or video editing software" (from 18% to 20%) and "Chinese input" (from 50% to 53%) in MS2 (Table 7.29, [S5]TQ31a-k).

When looking at teachers' self-evaluated proficiency of hardware skills in MS1, higher proportions of the teachers rated themselves as proficient or highly proficient in the "keyboard" (72%) and "printer" (72%). These were followed by "CD-ROM writer" (63%), "digital camera" (60%), "scanner" (53%) and "digital video recorder" (47%). Lower proportions of the teachers reported themselves as proficient or highly proficient in using all other types of hardware, such as "LCD projector" (36%), "network devices" (28%), "mobile devices" (25%) and "portable multi-media player devices" (23%). A statistically significant increase in MS2 was observed in teachers' self-evaluated proficiency levels in using "digital camera" (from 60% to 64%), "digital video recorder" (from 47% to 51%), "scanner" (from 53% to 57%), "mobile devices" (from 25% to 30%), "network devices" (from 28% to 31%) and "portable multi-media player devices" (from 23% to 27%) (Table 7.30, [S5]TQ32a-k).

Table 7.29 Teachers' self-evaluated levels of proficiency in software use ([S5]TQ31a-k)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all									
a. Word processing software	4.03	0.64	2719	556	(20)	1736	(64)	393	(14)	25	(1)	9	(0)	4.04	0.64	2023	426	(21)	1282	(63)	294	(15)	17	(1)	4	(0)	0.653
b. Spreadsheet	3.55	0.87	2715	280	(10)	1271	(47)	892	(33)	202	(7)	70	(3)	3.62	0.82	2022	221	(11)	1004	(50)	647	(32)	114	(6)	36	(2)	0.007**
c. Presentation software	3.81	0.78	2715	430	(16)	1504	(55)	648	(24)	104	(4)	29	(1)	3.84	0.76	2023	330	(16)	1138	(56)	476	(24)	61	(3)	18	(1)	0.271
d. Online communication software (e.g. E-mail).	3.90	0.72	2716	473	(17)	1612	(59)	546	(20)	69	(3)	16	(1)	3.92	0.71	2023	369	(18)	1186	(59)	419	(21)	41	(2)	8	(0)	0.558
e. Online information searching tools (e.g. browser and search engine)	3.89	0.76	2716	495	(18)	1566	(58)	546	(20)	82	(3)	27	(1)	3.92	0.74	2022	380	(19)	1182	(58)	401	(20)	41	(2)	18	(1)	0.246
f. Web design/editing software	2.72	1.08	2717	119	(4)	539	(20)	931	(34)	708	(26)	420	(15)	2.71	1.11	2020	93	(5)	401	(20)	698	(35)	475	(24)	353	(17)	0.837
g. Computer graphic design (e.g. drawing and photo editing software)	2.74	1.13	2718	132	(5)	598	(22)	902	(33)	610	(22)	476	(18)	2.79	1.13	2023	102	(5)	486	(24)	658	(33)	444	(22)	333	(16)	0.120
h. Multi-media design software (e.g. animation design)	2.11	1.16	2714	71	(3)	325	(12)	586	(22)	589	(22)	1143	(42)	2.21	1.20	2020	68	(3)	267	(13)	487	(24)	394	(20)	804	(40)	0.009**
i. Programming (e.g. Logo and Java)	1.77	1.11	2710	61	(2)	226	(8)	399	(15)	364	(13)	1660	(61)	1.85	1.18	2015	58	(3)	198	(10)	326	(16)	242	(12)	1191	(59)	0.034*
j. Audio/Video editing software (e.g. editing and file format conversion)	2.21	1.22	2708	101	(4)	387	(14)	574	(21)	554	(20)	1092	(40)	2.31	1.22	2017	81	(4)	315	(16)	484	(24)	410	(20)	727	(36)	0.002**
k. Chinese input	3.19	1.33	2701	432	(16)	918	(34)	553	(20)	332	(12)	466	(17)	3.29	1.29	2017	334	(17)	736	(36)	445	(22)	191	(9)	311	(15)	0.015*

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.30 Teachers' self-evaluated levels of proficiency in hardware use ([S5]TQ32a-k)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all									
a. Printer	3.83	0.74	2719	427	(16)	1521	(56)	677	(25)	79	(3)	15	(1)	3.84	0.70	2024	290	(14)	1188	(59)	492	(24)	43	(2)	11	(1)	0.817
b. CD-ROM (CD-R or DVD-R) Writer	3.66	0.90	2715	391	(14)	1318	(49)	762	(28)	170	(6)	74	(3)	3.70	0.84	2021	273	(14)	1056	(52)	559	(28)	84	(4)	49	(2)	0.118
c. Digital Camera	3.59	0.95	2713	385	(14)	1241	(46)	766	(28)	224	(8)	97	(4)	3.67	0.89	2023	298	(15)	992	(49)	564	(28)	112	(6)	57	(3)	0.004**
d. Digital Video Recorder	3.25	1.11	2713	271	(10)	992	(37)	850	(31)	333	(12)	267	(10)	3.35	1.07	2018	215	(11)	806	(40)	632	(31)	197	(10)	168	(8)	0.001**
e. Scanner	3.46	0.99	2711	350	(13)	1080	(40)	877	(32)	287	(11)	117	(4)	3.52	0.95	2023	238	(12)	910	(45)	620	(31)	176	(9)	79	(4)	0.038*
f. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)]	2.48	1.29	2709	155	(6)	525	(19)	700	(26)	419	(15)	910	(34)	2.64	1.30	2021	136	(7)	464	(23)	549	(27)	271	(13)	601	(30)	0.000***
g. Network Devices (e.g. Domestic Network Devices)	2.59	1.27	2713	153	(6)	593	(22)	756	(28)	412	(15)	799	(29)	2.73	1.26	2022	135	(7)	485	(24)	614	(30)	280	(14)	508	(25)	0.000***
h. Portable Computer Game Devices	2.15	1.26	2712	119	(4)	364	(13)	583	(21)	388	(14)	1258	(46)	2.30	1.27	2013	95	(5)	318	(16)	508	(25)	273	(14)	819	(41)	0.000***
i. Portable Multi-media Player Devices	2.42	1.27	2706	141	(5)	488	(18)	680	(25)	453	(17)	944	(35)	2.59	1.28	2018	124	(6)	432	(21)	559	(28)	308	(15)	595	(29)	0.000***
j. LCD Projector	2.98	1.16	2710	207	(8)	770	(28)	898	(33)	432	(16)	403	(15)	3.04	1.13	2016	154	(8)	599	(30)	705	(35)	294	(15)	264	(13)	0.078
k. Use of Keyboard	3.84	0.79	2704	470	(17)	1500	(55)	608	(22)	88	(3)	38	(1)	3.85	0.77	2012	351	(17)	1093	(54)	500	(25)	45	(2)	23	(1)	0.765

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.2.2 Perceived Application of IT in Teaching

School heads were satisfied with teachers' use of IT in daily teaching and learning management as well as in cross-subject learning activities

Table 7.31 ([S1]HSQ2e-k,3b) shows the satisfaction levels of school heads with respect to the teachers' use of IT in teaching. In MS1, 82% of the respondents were satisfied or very satisfied with the outcome on teachers' use of IT in daily teaching and learning management. 78% of them were satisfied or very satisfied that teachers could provide students with the opportunities to use IT in various cross-subject learning activities. Both items had mean ratings higher than 3.88 on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. As for the other outcomes of empowering teachers with IT, around two-thirds of the respondents were satisfied or very satisfied with outcomes such as teachers' use of IT in promoting students to learn subject knowledge of different KLAs (66%), teachers' use of IT in creating the opportunities for students to work collaboratively (61%) and the opportunities created by teachers to encourage students to develop their learning ability with the use of IT, and to foster students' positive attitude and value of using IT (60%). A relatively smaller proportion of school heads were satisfied or very satisfied with the outcomes that teachers could use IT to monitor and assess the performance of students (51%), to create a learning environment to support students' active independent learning (51%) and to collate information on students' progress in learning so as to tailor for individual differences through learning activities (47%), with mean ratings fell in the range of 3.41 to 3.49 (SD:0.69-0.72) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was observed in school heads' levels of satisfaction with teachers' use of IT in teaching in MS2.

Teachers perceived a higher level of agreement that they used IT to motivate students in the learning of key learning areas as well as provided opportunities for students to acquire IT knowledge and skills, but they perceived a lower level of agreement that they used IT for monitoring and assessment of students' performance and learning progress

When secondary school teachers were asked about their perceived application of IT into different learning and teaching tasks (Table 7.32, [S5]TQ30a-h), as reported in MS1, around half of the teachers agreed or strongly agreed that they used IT to achieve learning outcomes, such as using IT to motivate students in the learning of respective KLAs (54%) and providing the opportunities for students to acquire IT knowledge and skills (52%). Around 45% of the surveyed teachers agreed or strongly agreed that they made use of IT to create the opportunities for students to work collaboratively (47%), to encourage students to develop their learning ability and to foster their positive attitude and value in using IT (46%), to create a supportive learning environment for students' active independent learning (46%) and to facilitate them to use IT in cross-curricular learning activities (45%). On the other hand, 37% of the surveyed teachers agreed or strongly agreed that they applied IT for monitoring and assessment of students' performance as well as to encourage students' continuous improvement. 36% of the respondents agreed or strongly agreed that they used IT as a tool in collating information on students' progress in learning so that learning activities could be designed to cater for individual learning differences. No statistically significant difference was observed in all items of teachers' self-evaluation on their cognition and application of ITEd in MS2.

Table 7.31 School heads' levels of satisfaction with teachers' use of IT in teaching ([S1]HSQ2e-k,3b)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied	
2e.	3.94	0.61	397	55	(14)	269	(68)	66	(17)	7 (2)	0 (0)	3.96	0.61	354	53	(15)	241	(68)	55	(16)	4 (1)	1 (0)	0.530
2f.	3.68	0.61	397	18	(5)	244	(61)	123	(31)	12 (3)	0 (0)	3.72	0.60	354	20	(6)	221	(62)	108	(31)	4 (1)	1 (0)	0.376
2g.	3.63	0.65	397	25	(6)	214	(54)	146	(37)	12 (3)	0 (0)	3.67	0.63	354	22	(6)	202	(57)	122	(34)	8 (2)	0 (0)	0.416
2h.	3.49	0.69	397	19	(5)	183	(46)	169	(43)	26 (7)	0 (0)	3.56	0.70	354	25	(7)	165	(47)	149	(42)	14 (4)	1 (0)	0.215
2i.	3.41	0.72	397	16	(4)	169	(43)	174	(44)	38 (10)	0 (0)	3.48	0.72	354	21	(6)	153	(43)	157	(44)	21 (6)	2 (1)	0.225
2j.	3.48	0.69	397	18	(5)	183	(46)	168	(42)	28 (7)	0 (0)	3.56	0.68	354	21	(6)	172	(49)	146	(41)	14 (4)	1 (0)	0.149
2k.	3.63	0.68	397	27	(7)	215	(54)	137	(35)	18 (5)	0 (0)	3.70	0.66	354	29	(8)	201	(57)	116	(33)	6 (2)	2 (1)	0.161
3b	3.89	0.59	397	47	(12)	262	(66)	85	(21)	3 (1)	0 (0)	3.92	0.61	354	48	(14)	233	(66)	68	(19)	5 (1)	0 (0)	0.473

Aspects related to teachers' application of ITEd

2e. Teachers can use IT in their daily teaching and learning management.
2f. Teachers can use IT to promote students in learning the subject knowledge of different key learning areas (KLAs) (e.g. to establish the context for learning and to explain abstract concepts).
2g. Teachers can create opportunities to encourage students to develop their learning ability with the use of IT, and to foster students' positive attitude and value of using IT.
2h. Teachers can use IT to monitor and to assess the performance of students so as to encourage students' continuous improvement.
2i. Teachers use IT to collate information on students' progress in learning so that learning activities can be designed to cater for individual needs.
2j. Teachers can use IT to create a learning environment to support students' active independent learning.
2k. Teachers can use IT to create opportunities for students to work collaboratively.
3b. Teachers can provide students the opportunity to use IT in various cross-subject learning activities.
Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.32 Teachers' levels of agreement on their cognition and application of ITEd ([S5]TQ30a-h)

	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						
				Strongly agree	Agree	Neutral	Disagree	Strongly disagree					Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
a. You have used IT to motivate students in the learning of respective Key Learning Areas (KLAs) (e.g. to establish the learning context and to explain abstract concepts).	3.49	0.72	2713	91 (3)	1395 (51)	1009 (37)	187 (7)	31 (1)		3.49	0.75	2019	93 (5)	1006 (50)	748 (37)	147 (7)	25 (1)		0.915
b. You have created opportunities to encourage students to develop their learning ability with the use of IT, and to foster positive attitude and value in using IT.	3.37	0.73	2715	67 (2)	1186 (44)	1177 (43)	255 (9)	30 (1)		3.35	0.76	2017	71 (4)	826 (41)	891 (44)	202 (10)	27 (1)		0.350
c. You have used IT to monitor and assess the performance of students as well as to encourage students' continuous improvement.	3.18	0.80	2716	49 (2)	948 (35)	1235 (45)	417 (15)	67 (2)		3.21	0.82	2017	57 (3)	712 (35)	898 (45)	299 (15)	51 (3)		0.256
d. You have used IT as a tool to collate information on students' progress in learning so that learning activities can be designed to cater for individual learning differences.	3.16	0.81	2717	57 (2)	911 (34)	1233 (45)	445 (16)	71 (3)		3.20	0.84	2016	68 (3)	699 (35)	870 (43)	328 (16)	51 (3)		0.114
e. You have provided opportunities for students to acquire IT knowledge and skills.	3.44	0.76	2718	94 (3)	1325 (49)	1015 (37)	245 (9)	39 (1)		3.42	0.80	2017	98 (5)	907 (45)	794 (39)	180 (9)	38 (2)		0.324
f. You have facilitated students to use IT in cross-curricular learning activities.	3.31	0.79	2713	74 (3)	1126 (42)	1131 (42)	333 (12)	49 (2)		3.30	0.81	2015	72 (4)	794 (39)	864 (43)	235 (12)	50 (2)		0.611
g. You have used IT to create a supportive learning environment for students' active independent learning.	3.35	0.76	2717	63 (2)	1186 (44)	1150 (42)	273 (10)	45 (2)		3.35	0.78	2016	71 (4)	840 (42)	873 (43)	196 (10)	36 (2)		0.984
h. You have used IT to create opportunities for students to work collaboratively.	3.35	0.76	2710	58 (2)	1207 (45)	1131 (42)	266 (10)	48 (2)		3.34	0.78	2014	64 (3)	832 (41)	885 (44)	187 (9)	46 (2)		0.350

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.2.3 Belief and Attitude towards Using IT for Learning and Teaching

Teachers perceived a higher level of agreement that the use of IT could enhance teaching effectiveness, but they perceived a lower level of agreement that it could strengthen the relationship between teachers and students

Teachers' belief and attitude towards using IT for teaching were examined by asking the surveyed teachers to indicate their levels of agreement to a number of benefits about using IT for teaching. In MS1, 71% of them agreed or strongly agreed that IT could enhance teaching effectiveness. About 40% to 45% of the teachers agreed or strongly agreed to other benefits of using IT: time-saving and convenient (45%), facilitating assessment and evaluation of students' learning progress (45%), facilitating effective planning and management of teaching process (43%) as well as providing immediate feedback to students in their learning (42%). With regard to strengthening the relationship between teachers and students, the lowest level of agreement was received (26%), with a mean rating of 2.96 (SD:0.85) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 7.33, [S5]TQ16a-f). With respect to the teachers' perception of difficulties or obstacles in using IT for teaching, 62% of the teachers agreed or strongly agreed that the use of IT increased teaching workload. 51% of them agreed or strongly agreed that the design of general classrooms was unsuitable for the use of IT in teaching. 39% of them agreed or strongly agreed that students' concentration would be distracted when using computers for individual or small-group learning. 36% of them agreed or strongly agreed that their schools lacked concrete and effective schemes to promote ITEd (Table 7.33, [S5]TQ16g-j).

A statistically significant increase was observed in teachers' levels of agreement to the statement of "it saves time and is convenient to use IT" (from 45% to 47%) in MS2. A statistically significant decrease was spotted in MS2 for teachers' level of agreement to the statements of "the use of IT increases teaching workload" (from 62% to 57%) and "the design of general classrooms is unsuitable for the use of IT in teaching" (from 51% to 47%).

Teachers tended to be willing to allocate more time to apply IT in teaching

Teachers' belief and attitude towards using IT for learning and teaching could also be reflected by their willingness to allocate more time to apply IT in teaching. In MS1, 36% of the secondary school teachers were willing or very willing to do so whereas 13% of them were not very willing or totally not willing to do so, with a mean rating of 3.22 (SD:0.74) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. A slight increase was observed in teachers' willingness (from 36% to 37%) in MS2 (Table 7.34, [S5]TQ20).

Table 7.33 Teachers' levels of agreement on the aspects related to the use of IT in teaching ([S5]TQ16a-j)

Aspects related to the use of IT in teaching	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Strongly agree		Agree		Neutral		Disagree		Strongly disagree									
a. Teaching effectiveness is enhanced with the use of IT	3.73	0.64	2720	168	(6)	1763	(65)	703	(26)	68	(3)	18	(1)	3.76	0.63	2025	145	(7)	1319	(65)	511	(25)	40	(2)	10	(0)	0.145
b. It saves time and is convenient to use IT	3.23	0.92	2714	111	(4)	1102	(41)	905	(33)	492	(18)	104	(4)	3.29	0.92	2021	99	(5)	856	(42)	663	(33)	328	(16)	75	(4)	0.038*
c. The use of IT facilitates the assessment and evaluation of students' learning progress	3.35	0.74	2719	70	(3)	1129	(42)	1230	(45)	252	(9)	38	(1)	3.39	0.73	2020	64	(3)	862	(43)	902	(45)	174	(9)	18	(1)	0.112
d. The use of IT can provide immediate feedback to students in their learning	3.31	0.74	2719	73	(3)	1058	(39)	1268	(47)	287	(11)	33	(1)	3.35	0.74	2023	58	(3)	831	(41)	926	(46)	181	(9)	27	(1)	0.060
e. The use of IT facilitates effective planning and management of teaching process	3.31	0.76	2717	69	(3)	1083	(40)	1214	(45)	311	(11)	40	(1)	3.35	0.74	2021	63	(3)	818	(40)	927	(46)	188	(9)	25	(1)	0.092
f. The use of IT can strengthen the relationship between teachers and students	2.96	0.85	2719	53	(2)	646	(24)	1279	(47)	610	(22)	131	(5)	3.00	0.84	2021	42	(2)	508	(25)	967	(48)	421	(21)	83	(4)	0.066
g. Students' concentration will be distracted when using computers for individual or small-group learning	3.28	0.78	2719	117	(4)	948	(35)	1250	(46)	386	(14)	18	(1)	3.28	0.78	2018	76	(4)	724	(36)	935	(46)	255	(13)	28	(1)	0.718
h. The use of IT increases teaching workload	3.68	0.81	2718	380	(14)	1295	(48)	854	(31)	173	(6)	16	(1)	3.57	0.84	2020	233	(12)	906	(45)	696	(34)	158	(8)	27	(1)	0.000***
i. The design of general classrooms is unsuitable for the use of IT in teaching	3.47	0.91	2716	324	(12)	1067	(39)	913	(34)	385	(14)	27	(1)	3.38	0.92	2024	199	(10)	750	(37)	725	(36)	318	(16)	32	(2)	0.001***
j. The school is in lack of concrete and effective scheme to promote ITEd	3.22	0.83	2714	142	(5)	832	(31)	1267	(47)	429	(16)	44	(2)	3.21	0.85	2018	108	(5)	616	(31)	944	(47)	300	(15)	50	(2)	0.969

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.34 Teachers' levels of willingness to allocate more time to apply IT in teaching ([S5]TQ20)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option										*P*-value
				Very willing		Willing		Maybe (一般)		Not very willing (不願意)		Totally not willing		
Teachers' level of willingness to allocate more time to apply IT in teaching														
MS1	3.22	0.74	2694	44	(2)	911	(34)	1384	(51)	297	(11)	58	(2)	0.049*
MS2	3.26	0.73	2015	42	(2)	706	(35)	1047	(52)	183	(9)	37	(2)	

Mean: 1="Totally not willing" and 5="Very willing"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

7.2.4 Teaching with IT

Teachers adopted IT more frequently in language subjects

When asked to rate the extent to which IT had been adopted in class, as reported in MS1, 16% and 13% of the teachers indicated that computers had been used the most frequently in teaching "English Language/English Literature" and "Chinese Language/Chinese Literature" respectively. Other more frequently reported subjects were "Computer Literacy/Computer Studies/Information Technology/Computer and Information Technology/Computer Applications" (10%) and "Mathematics" (9%). No statistically significant difference was found in MS2 (Table 7.35, [S5]TQ2).

Table 7.35 The subjects which teachers used computers the most frequently in teaching after the commencement of the 2005/06 and 2006/07school years ([S5]TQ2)

Subjects	Percentage (%)		$\chi^2_{(df=11)}$	*P*-value
	MS1 (N=2727)	MS2 (N=2053)		
English Language/English Literature	16	18		
Chinese Language/Chinese Literature	13	14		
Computer Literacy/Computer Studies/Information Technology/Computer and Information Technology/Computer Applications	10	10		
Mathematics	9	9		
Chinese History	5	4		
Economics/Public Affairs/Commerce	5	5		
Integrated Science	4	4		
Biology/Human Biology	4	3		
Geography	4	4		
History	3	2	28.57	0.125
Physics	3	3		
Chemistry	3	3		
Art and Design	3	3		
Putonghua	2	1		
Liberal Studies	2	3		
Religious Studies	2	2		
Social Studies/Sociology/Psychology	1	0		
Home Economics	1	1		
Engineering/Design/Electronics/Technology	1	2		
Music	1	2		
Physical Education	1	1		
Others (Please specify: _____)	6	6		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

There was an increase in teachers' use of computers in class

Another aspect of computer usage by teachers is about the frequency and mode of usage in class. It is desirable for teachers to arrange more time for students to use computers in groups on meaningful tasks to construct knowledge. When asked about the use of IT in teaching, 55% of the teachers in MS1 used computers in class 1 to 10 times during the week prior to the conduct of the questionnaire survey while 35% reported having used computers in class 11 times or more. The difference between MS1 and MS2 in the frequency of using computer in class by teachers was statistically significant. The frequency of teachers using computers in class 1 to 10 times dropped by 3% (from 55% to 52%) while the frequency of teachers using computers in class 21 times to 30 times increased by 3% (from 9% to 12%) in MS2 (Table 7.36, [S5]TQ1).

Table 7.36 The frequency in which teachers used computers in class during the week prior to the conduct of the questionnaire survey ([S5]TQ1)

Frequency	Percentage (%)		$\chi^2_{(df=4)}$	*P*-value
	MS1 (N=2727)	MS2 (N=2053)		
31 times or more	4	5		
21 to 30 times	9	12		
11 to 20 times	22	22	11.46	0.022*
1 to 10 times	55	52		
Nil	10	10		

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers used computers the most frequently for explanation and demonstration to the whole class

As for the mode of computer usage, the most frequently reported mode that teachers used computers to conduct teaching in class in MS1 was for explanation and demonstration to the whole class (52% of the teachers rated frequently or very frequently). 15% of the teachers reported to have students working individually with computers frequently or very frequently while 59% of them rarely or never did so. Only 4% of the teachers reported to have students working in groups with computers frequently or very frequently and 77% of them rarely or never conducted teaching in class in this way. No statistically significant difference was observed in teachers' perceived frequency of the different ways they used computers to conduct teaching in class in MS2 (Table 7.37, [S5]TQ3a-c).

Teachers tended to use IT frequently to support students in learning subject knowledge

When looking into the frequency in which teachers used IT to conduct teaching, as reported in MS1, 47% of the teachers reported to have used IT frequently or very frequently to support students in learning subject knowledge. On the other hand, 23% of the teachers reported that they used IT frequently or very frequently to design a learning context to foster students' higher-order thinking capability. 10% of the teachers reported to have used IT to arrange learning in small groups frequently or very frequently. No statistically significant difference in teachers' frequency of using IT to conduct teaching was observed in MS2 (Table 7.38, [S5]TQ4a-c).

Two-thirds of the teachers assigned digital resources for students to learn subject knowledge beyond school hours

It is also important to find out the frequency in which secondary school teachers assigned digital resources to students as well as teachers' perception of the usefulness of these resources to students' learning. In MS1, 67% of the surveyed secondary school teachers reported having assigned digital resources to students for learning subject knowledge beyond school hours (Table 7.39, [S5]TQ10b). Amongst them, 68% of the teachers assigned digital resources 1 to 4 times during the week prior to the conduct of the questionnaire survey (Table 7.39, [S5]TQ10c). Table 7.39 illustrated that the difference between MS1 and MS2 in the frequency of assigning digital resources by teachers was statistically significant. In MS2, a decrease was noted in the percentages of teachers assigning digital resources to students for learning subject knowledge beyond school hours (from 67% to 61%). A decrease was found in the percentages of teachers assigning digital resources "5 times to 10 times" (from 17% to 14%), but a slight increase was found in the "16 times or above" (from 1% to 3%) in MS2.

Teachers rarely used electronic means to collect students' assignments and assess or respond to students' learning situation

Designing learning activities is just one aspect of the pedagogies in teaching with IT. IT can be used as an effective tool to collect students' assignments, to manage students' learning process, to report assessment results and to give timely feedback to students.

The findings revealed that teachers rarely used electronic ways to assess or respond to students' learning situation (Table 7.40, [S5]TQ6a-g). In MS1, less than 7% of the secondary school teachers (4%-6%) used the listed methods frequently or very frequently except for the means of e-mail (13% using it frequently or very frequently). The overall low frequency was also reflected in the mean values of these assessment methods or responses. All mean ratings fell in the range of 1.61 to 2.35 (SD:0.87-1.06) on a scale from 1 to 5 where 1 was 'never' and 5 was 'very frequently'.

Students had similar responses. In MS1, less than 18% of the students in secondary schools (10%-17% of S2, 6%-9% of S4 and 3%-7% of S6) indicated that their teachers assessed or responded to their learning situation frequently or very frequently through different electronic means. Although the mean ratings were somewhat higher than those reported by the teachers, there was only a very small difference in the means ratings amongst the different electronic methods. The mean ratings fell in the range of 1.53 to 2.35 (SD:0.85-1.20) on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 7.40, [S6]SQ6a-f).

There was a statistically significant increase in the frequency of teachers using the listed electronic means for assessing or responding to students' learning situation in MS2 (MS1: 4%-6%; MS2: 6%-9%) except the means of e-mail. According to students' responses, a statistically significant increase was noted in the frequency of teachers using different electronic means to assess or respond to students' learning situation (MS1: 3%-13% ; MS2: 4%-16%) except the means of the online test system of schools among S2 students and the means of e-mail among S4 students.

Table 7.37 Teachers' perceived frequency of the different ways they used computers to conduct teaching in class ([S5]TQ3a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very Frequently		Frequently		Occasionally (間中)		Rarely				Very Frequently		Frequently		Occasionally (間中)		Rarely		Never	
a. Using computer by yourself for explanation and demonstration to the whole class	3.63	1.07	2727	751	(28)	656	(24)	930	(34)	339	(12)	51	(2)	3.65	1.09	2051	595	(29)	482	(24)	675	(33)	257	(13)	42	(2)	0.483
b. Students working individually with computers	2.38	1.08	2727	133	(5)	263	(10)	722	(26)	996	(37)	613	(22)	2.38	1.09	2047	110	(5)	180	(9)	550	(27)	742	(36)	465	(23)	0.916
c. Students working in groups with computers	1.89	0.87	2727	20	(1)	82	(3)	532	(20)	1032	(38)	1061	(39)	1.93	0.94	2048	37	(2)	87	(4)	362	(18)	781	(38)	781	(38)	0.367

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.38 The frequency that teachers used IT to conduct teaching ([S5]TQ4a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very Frequently		Frequently		Occasionally (間中)		Rarely				Very Frequently		Frequently		Occasionally (間中)		Rarely		Never	
a. To support students in learning the subject knowledge	3.49	0.97	2727	466	(17)	827	(30)	1068	(39)	313	(11)	53	(2)	3.52	1.01	2049	400	(20)	611	(30)	741	(36)	247	(12)	50	(2)	0.243
b. To design learning context so as to foster students' higher-order thinking capability	2.86	0.97	2727	155	(6)	465	(17)	1157	(42)	755	(28)	195	(7)	2.92	1.01	2051	155	(8)	360	(18)	837	(41)	555	(27)	144	(7)	0.132
c. To arrange small group learning	2.45	0.90	2727	53	(2)	215	(8)	1029	(38)	1038	(38)	392	(14)	2.49	0.96	2050	67	(3)	176	(9)	749	(37)	754	(37)	304	(15)	0.365

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.39 Frequency of teachers assigning digital resources for students to learn subject knowledge beyond school hours during the week prior to the conduct of the questionnaire survey ([S5]TQ10b,c)

	Percentage (%)		*P*-value
	MS1 (N=2723)	MS2 (N=2043)	
Yes	67	61	
No	33	39	0.000*** [a]

Frequency	(N=1836)	(N=1251)	$\chi^2_{(df=4)}$	*P*-value
16 times or above	1	3		
11 to 15 times	3	3		
5 to 10 times	17	14	10.38	0.035* [b]
1 to 4 times	68	68		
Nil	11	12		

[a] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.40 The frequency of electronic means that teachers used for assessing or responding to students' learning situation ([S5]TQ6a-g, [S6]SQ6a-f)

Stakeholder/ Class levels		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never										
Teachers	a.	1.82	0.92	2727	33	(1)	102	(4)	440	(16)	907	(33)	1245	(46)	1.88	0.97	2048	48	(2)	76	(4)	331	(16)	722	(35)	871	(43)	0.036*
	b.	1.75	0.94	2727	42	(2)	99	(4)	385	(14)	798	(29)	1403	(51)	1.92	1.06	2048	65	(3)	115	(6)	336	(16)	615	(30)	917	(45)	0.000***
	c.	1.67	0.87	2727	29	(1)	70	(3)	349	(13)	803	(29)	1476	(54)	1.80	0.95	2046	37	(2)	78	(4)	308	(15)	638	(31)	985	(48)	0.000***
	d.	1.72	0.90	2727	28	(1)	94	(3)	381	(14)	804	(29)	1420	(52)	1.82	0.96	2047	37	(2)	77	(4)	335	(16)	638	(31)	960	(47)	0.000***
	e.	2.35	1.06	2727	83	(3)	272	(10)	857	(31)	818	(30)	697	(26)	2.36	1.07	2049	71	(3)	189	(9)	673	(33)	586	(29)	530	(26)	0.797
	f.	1.61	0.91	2727	37	(1)	87	(3)	321	(12)	623	(23)	1659	(61)	1.73	1.01	2047	50	(2)	89	(4)	273	(13)	484	(24)	1151	(56)	0.000***
	g.	1.97	0.92	2727	30	(1)	120	(4)	583	(21)	992	(36)	1002	(37)	2.03	0.96	2048	35	(2)	105	(5)	456	(22)	751	(37)	701	(34)	0.028*
S2	a.	2.35	1.18	2277	135	(6)	244	(11)	584	(26)	638	(28)	676	(30)	2.39	1.17	1861	126	(7)	172	(9)	505	(27)	547	(29)	510	(27)	0.902
	b.	2.17	1.14	2277	96	(4)	206	(9)	519	(23)	619	(27)	838	(37)	2.31	1.17	1861	95	(5)	201	(11)	473	(25)	507	(27)	585	(31)	0.002**
	c.	2.08	1.10	2277	75	(3)	170	(7)	505	(22)	636	(28)	892	(39)	2.19	1.12	1859	83	(4)	142	(8)	464	(25)	533	(29)	637	(34)	0.009**
	d.	1.92	1.10	2275	77	(3)	151	(7)	381	(17)	568	(25)	1098	(48)	2.04	1.16	1856	92	(5)	130	(7)	342	(18)	495	(27)	797	(43)	0.005**
	e.	2.01	1.13	2274	88	(4)	169	(7)	424	(19)	590	(26)	1002	(44)	2.11	1.17	1859	98	(5)	141	(8)	376	(20)	506	(27)	738	(40)	0.016*
	f.	1.84	1.20	2274	144	(6)	120	(5)	275	(12)	430	(19)	1306	(57)	1.95	1.21	1856	118	(6)	114	(6)	280	(15)	399	(21)	946	(51)	0.003**
S4	a.	2.07	1.04	2172	67	(3)	122	(6)	499	(23)	695	(32)	789	(36)	2.17	1.12	1805	81	(4)	135	(7)	418	(23)	544	(30)	627	(35)	0.018*
	b.	1.95	1.05	2171	53	(2)	137	(6)	407	(19)	616	(28)	957	(44)	2.05	1.10	1806	64	(4)	116	(6)	405	(22)	487	(27)	735	(41)	0.004**
	c.	1.86	1.00	2169	49	(2)	94	(4)	389	(18)	611	(28)	1026	(47)	2.00	1.07	1807	52	(3)	113	(6)	375	(21)	507	(28)	759	(42)	0.000***
	d.	1.79	1.03	2171	62	(3)	87	(4)	338	(16)	520	(24)	1164	(54)	1.95	1.16	1804	86	(5)	119	(7)	303	(17)	410	(23)	886	(49)	0.000***
	e.	1.97	1.08	2176	66	(3)	130	(6)	447	(21)	553	(25)	980	(45)	2.02	1.17	1806	89	(5)	128	(7)	327	(18)	437	(24)	824	(46)	0.410
	f.	1.75	1.08	2170	84	(4)	87	(4)	310	(14)	419	(19)	1269	(58)	1.91	1.18	1806	87	(5)	127	(7)	272	(15)	372	(21)	948	(52)	0.000***
S6	a.	1.64	0.91	1726	21	(1)	64	(4)	203	(12)	425	(25)	1013	(59)	1.69	0.89	1432	12	(1)	53	(4)	182	(13)	420	(29)	765	(53)	0.002**
	b.	1.59	0.92	1725	28	(2)	49	(3)	206	(12)	355	(21)	1088	(63)	1.64	0.89	1434	14	(1)	52	(4)	167	(12)	373	(26)	829	(58)	0.001***
	c.	1.53	0.85	1725	20	(1)	39	(2)	180	(10)	359	(21)	1129	(65)	1.58	0.83	1433	7	(1)	39	(3)	162	(11)	361	(25)	863	(60)	0.000***
	d.	1.56	0.90	1724	22	(1)	54	(3)	192	(11)	338	(20)	1118	(65)	1.61	0.89	1433	15	(1)	49	(3)	168	(12)	330	(23)	872	(61)	0.003**
	e.	1.82	1.02	1725	35	(2)	89	(5)	291	(17)	424	(25)	886	(51)	1.93	1.09	1433	53	(4)	78	(5)	252	(18)	373	(26)	676	(47)	0.000***
	f.	1.55	0.94	1723	39	(2)	53	(3)	163	(9)	312	(18)	1156	(67)	1.55	0.87	1431	21	(1)	36	(3)	128	(9)	343	(24)	903	(63)	0.045*

Methods to assess or respond to students' learning situation

a. To understand students' learning progress through the online test system of the school

b. To understand students' learning progress through the e-learning platform[#] records of the school

c. To understand students' learning progress through the opinion section of the e-learning platform

d. To give feedback to students through the forum/chatroom

e. To give feedback to students through Email

f. To give feedback to students through instant messaging system (e.g. ICQ)

g. To design learning activities based on the communication methods stated in (a) to (f) so as to cater for individual students' needs.

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

7.2.5 Confidence in Using IT for Learning and Teaching

Teachers tended to consider themselves as capable of integrating IT into teaching

As indicates in Table 7.41 ([S5]TQ27), teachers perceived themselves as capable of integrating IT into their daily teaching. In MS1, 47% of the secondary school teachers considered themselves to be capable or very capable of integrating IT into their daily teaching, with a mean rating of 3.42 (SD:0.73) on a scale of 1 to 5 where 1 was 'totally not capable' and 5 was 'very capable'. No statistically significant difference was observed in MS2.

Table 7.41 Teachers' capabilities of integrating IT into their daily teaching ([S5]TQ27)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable	
Capabilities of integrating IT into their daily teaching									
MS1	3.42	0.73	2711	126 (5)	1136 (42)	1216 (45)	214 (8)	19 (1)	0.381
MS2	3.44	0.73	2009	103 (5)	851 (42)	894 (44)	152 (8)	9 (0)	

Mean: 1="Totally not capable" and 5="Very capable"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers perceived a higher level of confidence in selecting appropriate digital resources to conduct teaching but they perceived a lower level of confidence in building a 'student-centred' learning environment with the use of digital resources and arranging small-group learning

When teachers were asked to rate their levels of confidence in using IT to conduct different teaching-related activities, as reported in MS1, 52% of the secondary school teachers rated themselves as confident or very confident in both selecting appropriate digital resources for teaching and using IT to support students in learning the subject knowledge. Levels of confidence in using IT to conduct the following teaching activities were relatively lower: nurturing students' capability in processing information (43% rated themselves as confident or very confident), designing learning context to foster students' higher-order thinking capability (36% themselves rated as confident or very confident), arranging small-group learning (31% themselves rated as confident or very confident) and building a 'student-centred' learning environment with the use of digital resources (25% themselves rated as confident or very confident). The above mean values fell in the range of 3.09 to 3.54 (SD: 0.65-0.77) on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident' (Table 7.42, [S5]TQ10f,g,17a-c,19a). Table 7.42 showed a statistically significant increase in the confidence level of teachers in selecting appropriate digital resources to conduct teaching (from 52% to 56%) in MS2.

Teachers perceived a higher level of agreement that their teaching could promote students' capability in information search, but they perceived a lower level of agreement that their teaching could promote students' capability in information collation and analysis as well as self-evaluation on learning outcomes

Pedagogical use of IT can be examined through the teachers' perceived effectiveness of promoting students' capability in performing different learning activities. When describing their approaches of using IT in their teaching, as reported in MS1, 62% of the secondary school teachers agreed or strongly agreed that their teaching could promote students' capability in "information search". Around 45% of the teachers agreed or strongly agreed that their teaching could promote students' skills in "information selection" (42%) as well as "reporting and presentation" (50%). The lowest ratings were given to the higher level learning activities such as "information collation and analysis" (37%) as well as "self-evaluation on learning outcome" (31%). No statistically significant difference was noted in MS2. (Table 7.43, [S5]TQ14a.i-v).

Table 7.42 Teachers' perceived levels of confidence in using IT to conduct different aspects of teaching activities ([S5]TQ10f,g,17a-c,19a)

Ways to use IT to conduct different aspects of teaching activities	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident										
10f. To select appropriate digital resources to conduct teaching	3.54	0.65	1836	80	(4)	879	(48)	797	(43)	76	(4)	4	(0)	3.58	0.68	1251	74	(6)	629	(50)	495	(40)	50	(4)	3	(0)	0.019*
10g. To nurture students' capability in processing information	3.38	0.69	1836	48	(3)	741	(40)	903	(49)	124	(7)	20	(1)	3.40	0.69	1251	42	(3)	516	(41)	597	(48)	90	(7)	6	(0)	0.315
17a. To support students in learning the subject knowledge	3.48	0.73	2713	120	(4)	1299	(48)	1077	(40)	193	(7)	24	(1)	3.50	0.72	2015	102	(5)	953	(47)	819	(41)	127	(6)	14	(1)	0.575
17b. To design learning context so as to foster students' higher-order thinking capability	3.22	0.77	2712	77	(3)	888	(33)	1340	(49)	362	(13)	45	(2)	3.26	0.77	2010	74	(4)	670	(33)	996	(50)	237	(12)	33	(2)	0.113
17c. To arrange small-group learning	3.15	0.77	2711	73	(3)	769	(28)	1423	(52)	397	(15)	49	(2)	3.17	0.77	2006	61	(3)	573	(29)	1060	(53)	272	(14)	40	(2)	0.468
19a. To build a student-centred learning environment with the use of digital resources	3.09	0.70	2706	37	(1)	639	(24)	1585	(59)	410	(15)	35	(1)	3.10	0.71	2008	39	(2)	468	(23)	1185	(59)	284	(14)	32	(2)	0.578

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.43 Teachers' perceived levels of agreement on promoting students' capability in performing different learning activities ([S5]TQ14a.i-v)

Learning activities that teachers can promote students' capability in performing	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Strongly agree		Agree		Neutral (一般)		Disagree		Strongly disagree										
i. Information search (e.g. using search engine)	3.65	0.74	2683	228	(8)	1454	(54)	855	(32)	123	(5)	23	(1)	3.64	0.71	2001	169	(8)	1054	(53)	687	(34)	80	(4)	11	(1)	0.497
ii. Information selection	3.35	0.72	2682	85	(3)	1048	(39)	1298	(48)	225	(8)	26	(1)	3.33	0.71	1999	64	(3)	735	(37)	1014	(51)	173	(9)	13	(1)	0.216
iii. Information collation and analysis (e.g. using spreadsheet)	3.23	0.79	2679	80	(3)	917	(34)	1262	(47)	374	(14)	46	(2)	3.24	0.77	1994	67	(3)	654	(33)	1002	(50)	236	(12)	35	(2)	0.727
iv. Reporting and Presentation (e.g. PowerPoint and website presentation)	3.44	0.76	2679	134	(5)	1202	(45)	1096	(41)	211	(8)	36	(1)	3.44	0.77	1996	115	(6)	858	(43)	842	(42)	160	(8)	21	(1)	0.758
v. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)	3.13	0.79	2672	60	(2)	782	(29)	1348	(50)	408	(15)	74	(3)	3.13	0.78	1991	49	(2)	561	(28)	1036	(52)	294	(15)	51	(3)	0.937

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.2.6 School Professional Development in ITEd for Teachers

School heads were satisfied with the sufficiency of teachers' ITEd professional development

School professional development is considered as one of the most important factors to promote ITEd in secondary schools. It is because effective development programmes are expected to enhance teachers' IT competency and facilitate teachers' development of a positive ITEd perception. In MS1, 79% of school heads were satisfied or very satisfied that teachers received sufficient professional development to enhance the quality of learning and teaching. No statistically significant difference was observed in MS2 (Table 7.44, [S1]HSQ4a).

Table 7.44 School heads' levels of satisfaction with the sufficiency of teachers' ITEd professional development ([S1]HSQ4a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
" Teachers receive sufficient professional development to enhance the quality of learning and teaching "									
MS1	3.88	0.59	397	43 (11)	269 (68)	80 (20)	5 (1)	0 (0)	0.576
MS2	3.90	0.59	354	37 (10)	251 (71)	58 (16)	8 (2)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

46% of the teachers had participated in ITEd professional development programmes in MS1 and there was a decrease to 35% in MS2

When teachers were asked about their actual participation in ITEd professional development programmes or activities in the 2004/05 school year, nearly half of the teachers (46%) in MS1 reported to have participated in the programmes or activities. There was a statistically significant decrease in teachers' actual participation in teachers' ITEd professional development programmes or activities in MS2. 35% of the teachers reported to have participated in these programmes in the 2005/06 school year (Table 7.45, [S5]TQ22a).

Teachers tended to find the ITEd professional development programmes to be practical and quite sufficient (一般)

The teachers were also asked to evaluate the professional development programmes or activities in terms of sufficiency and practicality. In MS1, 22% of the secondary school teachers perceived the provision to be sufficient or very sufficient whereas 16% of them considered them as insufficient or totally insufficient, with a mean rating of 3.05 (SD:0.67) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 7.46 [S5]TQ22h). 36% of the teachers found the programmes or activities practical or very practical, with a mean rating of 3.32 (SD:0.62) on a scale of 1 to 5 where 1 was 'totally not practical' and 5 was 'very practical' (Table 7.46 [S5]TQ22f). No statistically significant difference was observed in sufficiency and practicality level of the professional development programmes or activities in MS2.

Teachers were positive to the outcomes of ITEd professional development programmes and around half of them anticipated future participation

In MS1, more than half of the teachers agreed or strongly agreed that the programmes or activities enhanced their IT proficiency (67%), enhanced their capability in using IT for learning and teaching (64%) and increased their interest in IT (54%). No statistically significant difference was identified in MS2 (Tables 7.47, [S5]TQ22g.i-iii). 51% of the teachers indicated that they were willing or very willing to join such development programmes or activities, with a mean rating of 3.48 (SD:0.69) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing' . No statistically significant

difference was identified either in the percentages of teachers who were willing or very willing to participate in these programmes in the future in MS2 (Table 7.46, [S5]TQ23).

Teachers' ITEd professional development programmes should focus on the use of new technology in teaching as well as the IT application in subject or cross-curricula and project-based learning and teaching

When looking into the teachers' expectations of the themes of professional development programmes or activities (Table 7.45, [S5]TQ22i), as reported in MS1, the top three commonly selected themes were "IT application on subject or cross-curricular teaching" (61%), "using new technology in teaching" (59%) and "IT application on project-based or cross-curricular learning" (52%). They were followed by "webpage design" (35%), "IT facilities and digital resource management" (27% as well as "Computer operating skills" (26%). As for the modes of professional development programmes or activities, 66% to 70% of the respondents expected these programmes or activities to be conducted more often in the modes of training courses (70%) and workshops (66%) in MS1 (Table 7.45, [S5]TQ22j). A statistically significant increase was noted in the percentages of teachers' expected theme of webpage design (from 35% to 39%) for ITEd professional development programmes or activities in MS2. A statistically significant increase was also observed in the percentages of teachers choosing special lectures (from 30% to 35%) as the expected mode for ITEd professional development programmes or activities in the future in MS2.

Table 7.45 Teachers' expectations and actual participation in the themes and modes of ITEd professional development programmes or activities ([S5]TQ22a,c,d,i,j)

Teachers' participation in teachers' ITEd professional development programme/activity	**Percentage (%) of Teachers choosing the options**					
	Expectation			**Actual participation**		
				MS1 (N=2721)	**MS2 (N=2028)**	***P*-value**
YES				46	35	0.000***
NO				54	65	
Themes of ITEd professional development programmes/activities	**MS1 (N=2727)**	**MS2 (N=1982)**	***P*-value**	**MS1 (N=1264)**	**MS2 (N=704)**	***P*-value**
IT application on subject/cross-curricular teaching	61	60	0.437	68	61	0.002**
Use of new technology in teaching[#]	59	56	0.050	-	-	-
IT application on project-based or cross-curricular learning	52	51	0.559	36	35	0.765
Webpage design[#]	35	39	0.005**	-	-	-
IT facilities and digital resource management[#]	27	28	0.697	-	-	-
Computer operating skills/Basic computer operating skills	26	27	0.353	36	32	0.066
Network security	22	24	0.088	15	19	0.028*
Programming[#]	15	15	0.819	-	-	-
Internet communication	-	-	-	28	27	0.602
Others(Please specify: _____)	1	1	0.314	5	6	0.721
Modes of ITEd professional development programmes/activities						
Training courses	70	69	0.776	67	62	0.041*
Workshop	66	65	0.526	63	61	0.250
Special lectures	30	35	0.000***	30	31	0.469
Seminars	23	24	0.352	33	36	0.268
Classroom observation and exchanges	20	21	0.851	9	9	0.864
Training camp	6	7	0.071	1	1	0.588
Others(Please specify: _____)	1	1	0.271	0	2	0.012*

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [#]Themes included in [S5]TQ22i only

Table 7.46 Teachers' levels of sufficiency, practicality and willingness for future participation of the ITEd professional development programmes or activities ([S5]TQ22f,h,23)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very practical	Practical	Slightly practical (一般)	Not practical	Totally not practical	
Levels of practicality Mean: 1="Totally not practical" and 5="Very practical"									
MS1	3.32	0.62	1264	18 (1)	442 (35)	738 (58)	55 (4)	11 (1)	0.803
MS2	3.32	0.61	704	16 (2)	230 (33)	426 (61)	30 (4)	2 (0)	
	Mean (1-5)	**SD**	**N**	**Count (%) of Teachers choosing the option**					***P*-value**
				Very sufficient	**Sufficient**	**Quite sufficient (一般)**	**Insufficient**	**Totally Insufficient**	
Levels of sufficiency Mean: 1="Totally insufficient" and 5="Very sufficient"									
MS1	3.05	0.67	2520	21 (1)	522 (21)	1587 (63)	346 (14)	44 (2)	0.209
MS2	3.03	0.66	1805	20 (1)	327 (18)	1178 (65)	249 (14)	31 (2)	
	Mean (1-5)	**SD**	**N**	**Count (%) of Teachers choosing the option**					***P*-value**
				Very willing	**Willing**	**Maybe (一般)**	**Not very willing (不願意)**	**Totally not willing**	
Levels of willingness for future participation Mean: 1="Totally not willing" and 5="Very willing"									
MS1	3.48	0.69	2696	93 (3)	1294 (48)	1161 (43)	117 (4)	31 (1)	0.235
MS2	3.47	0.68	2004	77 (4)	909 (45)	908 (45)	94 (5)	16 (1)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.2.7 School ITEd Sharing and Collaboration among Teachers

Teachers tended to agree that they would share their teaching experience on using IT or teaching materials with colleagues and the others, but they perceived themselves having a lower level of capability to share their experience in promoting ITEd with the education community

Teachers' ITEd perception can be further illustrated by their involvement and capabilities to work collaboratively and share good practices with other teachers. In MS1, 39% of the secondary school teachers indicated that they were incapable or totally incapable of sharing their experience in promoting ITEd with the education community whereas 14% of them rated themselves as capable or very capable to do so, with a mean rating of 2.69 (SD:0.82) on a scale of 1 to 5 where 1 was 'totally not capable' and 5 was 'very capable'. A statistically significant increase was noted in teachers' perceived capability to share their experience in promoting ITEd with the education community (from 14% to 15%) in MS2 (Table 7.48, [S5]TQ29).

When we asked specifically about their views on ITEd collaboration and sharing, there was an evidence of relatively active participation. In MS1, 49% of the secondary school teachers agreed or strongly agreed that they would work collaboratively with their colleagues in promoting ITEd and 60% agreed or strongly agreed that they would share their experience on pedagogical use of IT with colleagues and the others. The mean values of these two items were 3.43 (SD:0.71) and 3.59 (SD:0.69) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 7.48, [S5]TQ18a,b). No statistically significant difference was observed in teachers' level of agreement on ITEd collaboration and sharing in MS2.

Table 7.47 Teachers' levels of agreement on the outcomes obtained from the ITEd professional development programmes or activities ([S5]TQ22g.i-iii)

Outcomes obtained from professional development programmes/activities	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Strongly agree		Agree		Neutral		Disagree		Strongly disagree									
i. Increase your interest in IT	3.48	0.73	1264	46	(4)	629	(50)	483	(38)	94	(7)	12	(1)	3.49	0.76	704	45	(6)	316	(45)	287	(41)	50	(7)	6	(1)	0.938
ii. Enhance your IT proficiency	3.67	0.64	1264	53	(4)	801	(63)	361	(29)	39	(3)	10	(1)	3.69	0.67	704	50	(7)	419	(60)	210	(30)	20	(3)	5	(1)	0.606
iii. Enhance your capability in using IT for learning and teaching	3.62	0.65	1264	41	(3)	767	(61)	397	(31)	51	(4)	8	(1)	3.64	0.69	704	46	(7)	391	(56)	237	(34)	25	(4)	5	(1)	0.820

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.48 Teachers' involvement and capabilities to work collaboratively and share good practices with other teachers ([S5]TQ18a,b,29)

Types of ITEd collaboration and sharing	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Strongly agree		Agree		Neutral		Disagree		Strongly disagree									
a. You will work collaboratively with your colleagues in promoting ITEd	3.43	0.71	2718	80	(3)	1253	(46)	1165	(43)	193	(7)	27	(1)	3.44	0.73	2022	74	(4)	940	(46)	833	(41)	152	(8)	23	(1)	0.499
b. You will share your teaching experience on using IT or teaching materials with colleagues and the others	3.59	0.69	2713	122	(4)	1515	(56)	938	(35)	114	(4)	24	(1)	3.60	0.70	2017	106	(5)	1131	(56)	666	(33)	96	(5)	18	(1)	0.452
(Mean: 1="Strongly disagree" and 5="Strongly agree")																										
Capabilities of sharing their experience in promoting IT culture with the education community	**MS1**										**MS2**										***P*-value**
	Mean (1-5)	**SD**	**N**	**Count (%) of Teachers choosing the option**							**Mean (1-5)**	**SD**	**N**	**Count (%) of Teachers choosing the option**							
				Very capable		**Capable**		**Quite capable (一般)**		**Not capable**		**Totally not capable**									
Levels of capabilities	2.69	0.82	2700	33	(1)	344	(13)	1267	(47)	874	(32)	182	(7)	2.75	0.81	2010	26	(1)	274	(14)	990	(49)	603	(30)	117	(6)	0.024*
(Mean: 1="Totally not capable" and 5="Very capable")																										

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.2.8 Areas for Improvement of ITEd Development

Teachers tended to agree that the use of IT increased teaching workload and the design of general classrooms was unsuitable for the use of IT in teaching

Teachers may encounter difficulties or obstacles when using IT in learning and teaching. These concerns should be taken into account the areas for improvement of ITEd development. The perception of the difficulties or obstacles in using IT for teaching as discussed in Section 7.2.3 may indicate some of the obstacles which hinder the development of ITEd. In MS1, 62% of the teachers agreed or strongly agreed that the use of IT increased teaching workload. The unsuitable design of general classrooms for the use of IT in teaching was another problem agreed or strongly agreed by 51% of the teachers. 39% of them agreed or strongly agreed that students' concentration would be distracted when using computers for individual or small-group learning. Lack of direction and understanding of how IT could fit into the overall education policy was another factor affecting the effective use of IT. 36% of them agreed or strongly agreed that their schools lacked concrete and effective scheme to promote ITEd. A statistically significant decrease was spotted in MS2 for teachers' level of agreement to the statements of "the use of IT increases teaching workload" (from 62% to 57%) and "the design of general classrooms is unsuitable for the use of IT in teaching" (from 51% to 47%). (Table 7.33, [S5]TQ16g-j).

Top three areas for improvement of ITEd development in Hong Kong as perceived by teachers were teachers' workload reduction, increase in IT experts or professionals in schools and the provision of digital resources for learning purposes

Teachers put up their views on the areas for improvement of ITEd development in Hong Kong. In MS1, over 70% of them agreed or strongly agreed that ITEd development could be better if the following could be achieved: increase in IT experts or professionals in schools (76%), increase in the provision of digital resources for learning purposes (75%), increase in IT facilities or digital resources or funding for the development of ITEd in schools (72%) and increase in teachers' ITEd professional development activities or opportunities (71%). In addition, 80% of the surveyed teachers agreed or strongly agreed that workload reduction was another area for improvement of ITEd development in Hong Kong. All of the above items had mean ratings between 3.85 and 4.22 (SD:0.73-0.85) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 is 'strongly agree'. A statistically significant decrease was observed in the improvement area of workload reduction (from 80% to 79%) in MS2 (Table 7.49, [S5]TQ21a-f).

Table 7.49 Teachers' views on the areas for improvement of ITEd development in Hong Kong ([S5]TQ21a-f)

Improvement areas	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Strongly agree		Agree		Neutral		Disagree		Strongly disagree									
a. Increase IT facilities/digital resources/funding for the development of ITEd in school	3.88	0.74	2716	496	(18)	1477	(54)	674	(25)	53	(2)	16	(1)	3.89	0.75	2027	402	(20)	1060	(52)	514	(25)	44	(2)	7	(0)	0.629
b. Increase IT experts/professionals in school	3.94	0.73	2717	570	(21)	1486	(55)	613	(23)	35	(1)	13	(0)	3.95	0.73	2023	431	(21)	1115	(55)	431	(21)	41	(2)	5	(0)	0.643
c. Increase the provision of digital resources for learning purposes	3.94	0.74	2712	576	(21)	1457	(54)	628	(23)	33	(1)	18	(1)	3.95	0.72	2023	434	(21)	1099	(54)	454	(22)	33	(2)	3	(0)	0.593
d. Increase teachers' ITEd professional development activities/opportunities	3.85	0.74	2711	462	(17)	1477	(54)	698	(26)	53	(2)	21	(1)	3.86	0.73	2022	358	(18)	1077	(53)	537	(27)	45	(2)	5	(0)	0.940
e. Reduce teachers' workload so that they can have more time to develop ITEd	4.22	0.85	2713	1231	(45)	945	(35)	463	(17)	51	(2)	23	(1)	4.15	0.82	2024	777	(38)	826	(41)	365	(18)	50	(2)	6	(0)	0.000***
f. Others (Please specify: _____)	3.23	0.96	323	41	(13)	47	(15)	206	(64)	4	(1)	25	(8)	3.10	0.90	307	16	(5)	64	(21)	192	(63)	6	(2)	29	(9)	0.236

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.3 Enhancing School Leadership for the Knowledge Age

The third strategic goal is "Enhancing school leadership for the knowledge age". The objective of this goal is to equip school heads with leadership capacities so that they can provide teachers with guidance and support for establishing schools' IT culture. The progress made under each of the following areas in this goal is examined:

- School ITEd Plan
- Activities to promote IT culture
- Resources and support
- School professional development in ITEd for school heads
- School heads' willingness to promote ITEd

7.3.1 School ITEd Plan

School heads were satisfied with their school ITEd plans and they perceived the highest level of satisfaction with their school ITEd plans covering the infrastructure requirements of schools

In MS1, as shown in Table 7.50 ([S1]HSQ5a-g), school heads showed high level of satisfaction with their school ITEd plans. 86% of them were satisfied or very satisfied with the ITEd plans which covered the infrastructure requirements of schools. 76% of school heads were satisfied or very satisfied that clear visions and goals were stated in the school ITEd plan while 71% of them were satisfied or very satisfied that the implementation strategies and action plans were clearly listed in the school ITEd plan. 70% of school heads were satisfied or very satisfied that their schools would implement and evaluate the effectiveness of the ITEd plans seriously. Around 70% of school heads were satisfied or very satisfied with the ITEd plans which covered the content or measures of integrating IT into learning and teaching (71%) as well as teachers' ITEd professional development (71%). 66% of school heads also were satisfied or very satisfied that teachers understood and participated in the school ITEd plan. The mean ratings ranged from 3.68 to 4.02 (SD:0.60-0.65) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was noted in school heads' satisfaction level with school ITEd plans in MS2.

The most important goal in formulating school ITEd plans was to enhance learning and teaching effectiveness

In relation to the importance of setting different goals in the formulation of school ITEd plans (Table 7.51, [P2]HQ1a-l), most of school heads regarded enhancing learning and teaching effectiveness (98%), improving students' learning outcomes (98%), enhancing students' understanding of subject content (94%) as well as fostering students' information literacy including information-processing skills and attitude (91%) as important or very important goals in the formulation of school ITEd plans in MS1. The next two important goals were strengthening students' initiative, independence and sense of responsibility in learning (89%) and strengthening or developing students' generic skills (85%). All of the above items had mean ratings greater than 4.00 on a scale from 1 to 5 where 1 was 'totally not important' and 5 was 'very important'. Around 70% indicated that providing suitable learning activities according to individual students' needs (77%), promoting learning through assessment (73%), providing training to prepare students for further studies or future careers (68%) as well as integrating related-topics for studies and promoting collaboration amongst different subjects (67%) were other important goals, with mean ratings between 3.74 and 3.96 (SD:0.65-0.72) on a scale from 1 to 5 where 1 represented 'totally not important' and 5 represented 'very important'. Two goals which they rated as relatively less important were meeting the expectations of parents and the

community (57%) and improving communication and co-operation among schools, parents and community (59%), with mean ratings of 3.56 (SD:0.71) and 3.64 (SD:0.72) respectively on a scale from 1 to 5 where 1 represented ‘totally not important’ and 5 represented ‘very important’. No statistically significant difference was found in school heads’ perceived level of the importance of different goals in formulating school ITEd plans in MS2.

Table 7.50 School heads' levels of satisfaction with the school ITEd plan ([S1]HSQ5a-g)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		
a.	3.85	0.63	397	46	(12)	255	(64)	88	(22)	8 (2)	3.85	0.57	354	33	(9)	239	(68)	79	(22)	3 (1)	0.875
b.	3.78	0.65	397	38	(10)	244	(61)	103	(26)	12 (3)	3.77	0.61	354	26	(7)	228	(64)	92	(26)	8 (2)	0.839
c.	4.02	0.61	397	71	(18)	269	(68)	50	(13)	7 (2)	4.01	0.59	354	60	(17)	240	(68)	51	(14)	3 (1)	0.690
d.	3.74	0.61	397	23	(6)	259	(65)	102	(26)	13 (3)	3.74	0.65	354	31	(9)	209	(59)	104	(29)	10 (3)	0.845
e.	3.75	0.65	397	29	(7)	255	(64)	98	(25)	14 (4)	3.72	0.63	354	24	(7)	218	(62)	102	(29)	10 (3)	0.419
f.	3.74	0.60	397	26	(7)	249	(63)	115	(29)	7 (2)	3.70	0.62	354	21	(6)	216	(61)	108	(31)	9 (3)	0.441
g.	3.68	0.65	397	26	(7)	233	(59)	123	(31)	15 (4)	3.69	0.67	354	28	(8)	202	(57)	111	(31)	13 (4)	0.854

	Totally not satisfied	
a.	0	(0)
b.	0	(0)
c.	0	(0)
d.	0	(0)
e.	0	(0)
f.	0	(0)
g.	0	(0)

Aspects related to the school ITEd Plan

a. Clear vision and goal are stated in the school ITEd plan.
b. The school ITEd plan covers the content/measures of integrating IT in teaching and learning.
c. The school ITEd plan covers the infrastructure requirements of the school.
d. The school ITEd plan covers teachers' ITEd professional development.
e. The school ITEd plan clearly lists out implementation strategies and action plans.
f. The school will implement and evaluate the effectiveness of the ITEd plan seriously.
g. Teachers understand and participate in the school ITEd plan.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.51 School heads' perception of the importance of different goals in formulating school ITEd plan ([S2]HQ1a-l)

Goals	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very important		Important		Quite important (一般)		Not important				Very important		Important		Quite important (一般)		Not important		
a.	4.50	0.54	390	205	(53)	176	(45)	9	(2)	0 (0)	4.44	0.57	351	169	(48)	169	(48)	13	(4)	0 (0)	0.182
b.	4.58	0.52	390	231	(59)	153	(39)	8	(2)	0 (0)	4.55	0.55	351	204	(58)	137	(39)	10	(3)	0 (0)	0.656
c.	4.24	0.56	390	118	(30)	250	(64)	21	(5)	1 (0)	4.24	0.57	351	108	(31)	219	(62)	24	(7)	0 (0)	0.926
d.	4.24	0.65	390	138	(35)	210	(54)	39	(10)	3 (1)	4.20	0.64	351	114	(32)	195	(56)	41	(12)	1 (0)	0.384
e.	4.09	0.65	390	95	(24)	239	(61)	51	(13)	5 (1)	4.09	0.65	351	89	(25)	205	(58)	56	(16)	1 (0)	0.914
f.	3.96	0.67	390	77	(20)	221	(57)	90	(23)	2 (1)	3.93	0.64	351	59	(17)	210	(60)	80	(23)	2 (1)	0.582
g.	3.81	0.72	390	60	(15)	206	(53)	114	(29)	10 (3)	3.73	0.69	351	40	(11)	187	(53)	114	(32)	10 (3)	0.138
h.	3.74	0.65	390	33	(8)	232	(59)	114	(29)	11 (3)	3.83	0.62	351	37	(11)	221	(63)	88	(25)	5 (1)	0.065
i.	4.21	0.59	390	119	(31)	235	(60)	36	(9)	0 (0)	4.19	0.61	351	106	(30)	207	(59)	38	(11)	0 (0)	0.707
j.	3.64	0.72	390	37	(9)	196	(50)	138	(35)	19 (5)	3.62	0.68	351	28	(8)	172	(49)	142	(40)	8 (2)	0.542
k.	3.87	0.66	390	59	(15)	227	(58)	99	(25)	5 (1)	3.85	0.69	351	56	(16)	193	(55)	96	(27)	6 (2)	0.691
l.	3.56	0.71	390	23	(6)	198	(51)	147	(38)	20 (5)	3.57	0.68	351	21	(6)	176	(50)	138	(39)	15 (4)	0.990

	Totally not important	
a.	0	(0)
b.	0	(0)
c.	0	(0)
d.	0	(0)
e.	0	(0)
f.	0	(0)
g.	0	(0)
h.	0	(0)
i.	0	(0)
j.	0	(0)
k.	0	(0)
l.	1	(0)

Goals

a. To improve students' learning outcomes
b. To enhance learning and teaching effectiveness
c. To enhance students' understanding of subject content
d. To strengthen students' initiative, independence and sense of responsibility in learning
e. To strengthen/develop students' generic skills (e.g. analytical skills, creativity, collaboration skills)
f. To provide suitable learning activities according to the needs of individual student
g. To provide training so as to prepare students for further studies/future careers
h. To integrate related topics for studies and promote collaboration amongst different subjects
i. To foster students' information literacy, including information-processing skills and attitude
j. To improve communication and cooperation among school, parents and community
k. To promote learning through assessment
l. To meet the expectations of parents and the community.

Mean: 1="Totally not important" and 5="Very important"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The top priority for school ITEd plans for the 2005/06 and 2006/07 school years was to improve students' use of IT in their learning

When asked about the three most important options to which schools gave priority to when setting ITEd plans for the 2005/06 and 2006/07 school years (Table 7.52, [S2]HQ4), a relatively high percentage of school heads chose the options of improving students' use of IT in their learning (71%), improving digital resources and the IT infrastructure in school (64%) as well as strengthening teachers' professional development on ITEd knowledge and its application (61%) as the top three priorities in the development of ITEd plans within their schools in MS1. Striving for support from the community to initiate ITEd and encouraging parents' participation in relevant activities (5%) was the lowest priority in school ITEd plans. No statistically significant difference was observed in the priorities of school ITEd plans in MS2.

Table 7.52 The priorities of school ITEd plan for the 2005/06 and 2006/07school years ([S2]HQ4)

Priorities	Percentage (%)		*P*-value
	MS1 (N=390)	MS2 (N=351)	
To improve students' use of IT in their learning	71	72	0.694
To improve digital resources and the IT infrastructure in school	64	63	0.797
To strengthen teachers' professional development on ITEd knowledge and its application	61	55	0.128
To promote the development of ITEd and build up the culture on the use of IT in school	51	48	0.481
To improve the implementation and evaluation of school ITEd Plan	26	28	0.383
To improve ITEd curriculum# in school	23	25	0.374
To strive for community support to initiate ITEd and encourage parents' participation in relevant activities	5	5	0.739
Others: (Please specify)	2	3	0.323

Three most important options; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd curriculum refers to the application of IT in learning and teaching in each KLA (including computer/IT curriculum), to develop IT skills, and to foster the development of information literacy (information processing skills and attitude) and generic skills (e.g. collaboration skill and creativity etc.).

Teachers tended to perceive the Computer or IT curriculum as sufficient in supporting teachers to facilitate students' use of IT in learning

When teachers were asked about the adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning, 40% of the secondary school teachers in MS1 indicated that it was sufficient or very sufficient, with a mean rating of 3.32 (SD:0.68) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was observed in MS2 in this area (Table 7.53, [S5]TQ26).

Table 7.53 Teachers' perception of the levels of adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning ([S5]TQ26)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					P-value
				Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient	
Adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning									
MS1	3.32	0.68	2704	50 (2)	1020 (38)	1406 (52)	204 (8)	24 (1)	0.980
MS2	3.32	0.68	2013	43 (2)	740 (37)	1076 (53)	133 (7)	21 (1)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers tended to have considerable participation in providing ITEd technical support for teachers, but they tended to have some participation in exchanging experience and insight on the use of IT in teaching with other schools/regions/countries when implementing school ITEd plans – a statistically significant increase was noted in the participation in exchanging experience and insight on the use of IT in teaching with others in MS2

The ITEd team teachers' perceived levels of participation in different tasks when implementing ITEd plan is further explored. In MS1, surveyed ITEd team teachers reported that they participated in all tasks to some extent with mean ratings of 3.03 to 3.49 (SD:0.96-1.13) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation' (Table 7.54, [S4]ITQ3a-m) except for the task of exchanging experience and insight on the use of IT in teaching with other schools/regions/countries [only 20% had considerable or strong participation with a mean rating of 2.57 (SD:1.08)]. The three tasks in which most of the ITEd team teachers rated themselves as having considerable or strong participation were providing ITEd technical support for teachers (55%), encouraging other teachers to make appropriate use of IT in teaching (47%) and formulating school-based ITEd plan (42%). Around two-fifths of them had considerable or strong participation in enhancing the fostering of information literacy in Computer/IT curriculum (41%) and across the KLAs (37%). 35% of them had considerable or strong participation in driving their schools to become an exemplary model of making use of IT in learning and teaching. 33% of them had considerable or strong participation in doing research and evaluation on the effectiveness of ITEd in school. In MS2, a statistically significant increase was observed in their participation levels in the following tasks: "to participate in formulating the school-based ITEd plan in school" (from 42% to 49%), "to set clear objectives and guidelines on IT infrastructure for school" (from 36% to 46%), "to make recommendations to school on the allocation and use of IT facilities and digital resources" (from 38% to 49%), "to co-ordinate all matters related to ITEd in school" (from 39% to 47%) and "to exchange experience and insight on the use of IT in teaching with other schools/regions/countries" (from 20% to 24%).

The two major problems encountered by school heads in the implementation of ITEd plans were teachers' heavy workload and lack of suitable educational software or digital resources

School heads' perceived difficulties or obstacles to the implementation of ITEd plans are reported in Table 7.55 ([S2]HQ3a-l). Among the listed difficulties, the top two problems often or most often encountered by schools in the implementation of ITEd plans in MS1 were teachers' heavy workload (63%) and the lack of suitable educational software or digital resources (42%). Around 60% of school heads rarely or never encountered a lack of clear objective in adopting IT in learning and teaching (60%) as well as a lack of concrete plan to encourage teachers to promote ITEd (59%). In MS2, there was a statistically significant decrease in the problem of "insufficient IT facilities" (from 20% to 15%).

From ITEd Team teachers' point of view, the top three difficulties that they frequently or very frequently encountered were insufficient IT facilities and digital resources from the EMB (38%), insufficient time to cope with ITEd team work (38%) and other teachers not having sufficient time to adopt IT in teaching (37%) in MS1 (Table 7.56, [S4]ITQ4a-k). No statistically significant difference was observed in the ITEd Team teachers' perceived level of frequency of difficulties encountered in promoting ITEd in MS2.

Table 7.54 ITEd Team teachers' perceived levels of participation in different tasks when implementing school ITEd plan ([S4]ITQ3a-m)

Tasks	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option							
				Strong participation		Considerable participation		Some participation (一般)		Little participation		None									
a.	3.25	1.10	339	45	(13)	98	(29)	119	(35)	51	(15)	26	(8)	3.48	1.06	229	42	(18)	70	(31)	85	(37)	19	(8)	13	(6)	0.017*
b.	3.10	1.11	339	35	(10)	88	(26)	125	(37)	57	(17)	34	(10)	3.37	1.05	229	34	(15)	71	(31)	80	(35)	34	(15)	10	(4)	0.005**
c.	3.17	1.12	339	42	(12)	88	(26)	129	(38)	47	(14)	33	(10)	3.45	1.03	229	35	(15)	79	(34)	79	(34)	25	(11)	11	(5)	0.004**
d.	3.13	1.11	339	31	(9)	103	(30)	120	(35)	49	(14)	36	(11)	3.35	1.07	229	30	(13)	79	(34)	76	(33)	29	(13)	15	(7)	0.023*
e.	3.35	0.96	339	28	(8)	133	(39)	123	(36)	38	(11)	17	(5)	3.42	0.88	229	23	(10)	82	(36)	97	(42)	22	(10)	5	(2)	0.640
f.	3.49	1.04	339	51	(15)	134	(40)	102	(30)	33	(10)	19	(6)	3.59	0.96	229	38	(17)	93	(41)	72	(31)	19	(8)	7	(3)	0.321
g.	3.11	1.08	339	24	(7)	109	(32)	125	(37)	43	(13)	38	(11)	3.24	0.95	229	16	(7)	76	(33)	96	(42)	29	(13)	12	(5)	0.286
h.	3.07	1.03	339	23	(7)	96	(28)	132	(39)	59	(17)	29	(9)	3.23	0.95	229	18	(8)	70	(31)	97	(42)	34	(15)	10	(4)	0.111
i.	3.12	1.13	339	33	(10)	102	(30)	112	(33)	55	(16)	37	(11)	3.31	1.03	229	29	(13)	67	(29)	92	(40)	28	(12)	13	(6)	0.075
j.	3.03	1.02	339	15	(4)	100	(29)	137	(40)	53	(16)	34	(10)	3.17	1.03	229	20	(9)	68	(30)	90	(39)	34	(15)	17	(7)	0.127
k.	2.57	1.08	339	12	(4)	53	(16)	118	(35)	89	(26)	67	(20)	2.79	1.05	229	13	(6)	42	(18)	84	(37)	65	(28)	25	(11)	0.020*
l.	3.17	1.05	339	25	(7)	114	(34)	125	(37)	43	(13)	32	(9)	3.31	0.91	229	21	(9)	70	(31)	104	(45)	27	(12)	7	(3)	0.299
m	3.14	0.98	339	19	(6)	106	(31)	144	(42)	43	(13)	27	(8)	3.25	0.88	229	15	(7)	69	(30)	112	(49)	24	(10)	9	(4)	0.333

Tasks

a. To participate in formulating the school-based ITEd plan in school
b. To set clear objectives and guidelines on IT infrastructure for school
c. To make recommendations to school on the allocation and use of IT facilities and digital resources
d. To co-ordinate all matters related to ITEd in school
e. To encourage teachers to make appropriate use of IT in teaching
f. To provide ITEd technical support to teachers
g. To provide ITEd professional development to teachers
h. To drive the school to become an exemplary model of making use of IT in teaching and learning
i. To explore new technology (e.g. wireless network system) and develop innovative teaching methods
j. To research and evaluate on the effectiveness of ITEd in school
k. To exchange experience and insight on the use of IT in teaching with other schools/regions/countries
l. To enhance the fostering of information literacy (e.g. information-processing skills and attitude) in Computer/IT curriculum
m. To enhance the fostering of information literacy (e.g. information-processing skills and attitude) across the key learning areas

Mean: 1= "None" and 5="Strong participation"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.55 School heads' perceived frequency of difficulties encountered in implementing of ITEd plan ([S2]HQ3a-l)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Most often		Often		Occasionally (間中)		Rarely		Never									
a.	3.83	0.89	390	104	(27)	140	(36)	122	(31)	24 (6)	0	(0)	3.69	0.92	351	70	(20)	140	(40)	103	(29)	37 (11)	1 (0)	0.053
b.	2.74	0.78	390	11	(3)	37	(9)	192	(49)	140 (36)	10	(3)	2.72	0.76	351	6	(2)	38	(11)	169	(48)	129 (37)	9 (3)	0.851
c.	2.61	0.76	390	5	(1)	37	(9)	162	(42)	172 (44)	14	(4)	2.68	0.75	351	4	(1)	34	(10)	173	(49)	125 (36)	15 (4)	0.102
d.	3.01	0.91	390	27	(7)	71	(18)	179	(46)	104 (27)	9	(2)	3.01	0.92	351	26	(7)	62	(18)	165	(47)	87 (25)	11 (3)	0.878
e.	2.70	0.86	390	11	(3)	51	(13)	159	(41)	149 (38)	20	(5)	2.70	0.85	351	8	(2)	49	(14)	141	(40)	137 (39)	16 (5)	0.971
f.	2.76	0.85	390	6	(2)	65	(17)	171	(44)	127 (33)	21	(5)	2.66	0.78	351	6	(2)	30	(9)	170	(48)	127 (36)	18 (5)	0.066
g.	2.32	0.82	390	1	(0)	26	(7)	127	(33)	177 (45)	59	(15)	2.30	0.81	351	3	(1)	21	(6)	101	(29)	179 (51)	47 (13)	0.618
h.	2.38	0.84	390	1	(0)	38	(10)	121	(31)	179 (46)	51	(13)	2.34	0.85	351	2	(1)	32	(9)	101	(29)	166 (47)	50 (14)	0.486
i.	2.48	0.97	390	13	(3)	44	(11)	113	(29)	169 (43)	51	(13)	2.42	0.96	351	12	(3)	31	(9)	102	(29)	153 (44)	53 (15)	0.352
j.	2.47	1.14	390	22	(6)	52	(13)	100	(26)	131 (34)	85	(22)	2.38	1.11	351	18	(5)	40	(11)	80	(23)	134 (38)	79 (23)	0.263
k.	2.52	1.06	390	15	(4)	61	(16)	101	(26)	148 (38)	65	(17)	2.33	1.05	351	13	(4)	37	(11)	83	(24)	139 (40)	79 (23)	0.012*
l.	3.32	1.00	390	51	(13)	114	(29)	145	(37)	69 (18)	11	(3)	3.20	0.99	351	36	(10)	94	(27)	135	(38)	75 (21)	11 (3)	0.088

Difficulties

a. The workload of teachers is so heavy that they cannot afford time to apply IT in their teaching
b. Teachers lack ITEd knowledge/skills in applying IT in teaching
c. Teachers lack interest in using IT
d. The time which teachers need to prepare teaching materials with IT or participate in related ITEd professional development activities affects their teaching
e. The current teachers' professional development programs cannot foster/develop the requisite IT skills for teachers
f. The existing curriculum is not conducive to the use of IT for teaching in class
g. The school does not have a clear objective in adopting IT in teaching and learning
h. The school is in lack of concrete plan to encourage teachers to promote ITEd
i. Insufficient technical support in school
j. Insufficient computer rooms
k. Insufficient IT facilities (e.g. computers and internet facilities)
l. Lacking in suitable educational software/digital resources

Mean: 1= "Never" and 5="Most often"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.56 ITEd Team teachers' perceived frequency of difficulties encountered in promoting ITEd ([S4]ITQ4a-k)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option								Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option							
				Very Frequently		Frequently		Occasionally (間中)		Rarely					Very Frequently		Frequently		Occasionally (間中)		Rarely		
a.	2.66	0.82	339	6	(2)	43	(13)	134	(40)	141	(42)	15	(4)	2.70	0.84	229	3	(1)	35	(15)	94	(41)	85	(37)	12	(5)	0.429
b.	2.32	0.85	339	5	(1)	24	(7)	92	(27)	172	(51)	46	(14)	2.34	0.88	229	4	(2)	19	(8)	59	(26)	115	(50)	32	(14)	0.937
c.	2.56	0.88	339	10	(3)	31	(9)	126	(37)	143	(42)	29	(9)	2.59	0.91	229	3	(1)	36	(16)	75	(33)	93	(41)	22	(10)	0.672
d.	2.85	0.95	339	15	(4)	71	(21)	118	(35)	119	(35)	16	(5)	2.79	1.00	229	12	(5)	41	(18)	80	(35)	79	(34)	17	(7)	0.447
e.	3.21	1.00	339	35	(10)	94	(28)	133	(39)	62	(18)	15	(4)	3.24	1.02	229	25	(11)	67	(29)	86	(38)	40	(17)	11	(5)	0.701
f.	2.52	0.90	339	8	(2)	33	(10)	126	(37)	133	(39)	39	(12)	2.55	0.93	229	4	(2)	30	(13)	82	(36)	84	(37)	29	(13)	0.717
g.	2.51	0.86	339	6	(2)	32	(9)	126	(37)	141	(42)	34	(10)	2.63	0.97	229	11	(5)	27	(12)	77	(34)	94	(41)	20	(9)	0.284
h.	3.20	0.90	339	23	(7)	101	(30)	144	(42)	64	(19)	7	(2)	3.13	0.95	229	17	(7)	60	(26)	97	(42)	46	(20)	9	(4)	0.371
i.	2.93	0.81	339	11	(3)	63	(19)	161	(47)	100	(29)	4	(1)	2.88	0.86	229	8	(3)	40	(17)	107	(47)	65	(28)	9	(4)	0.568
j.	2.91	0.85	339	10	(3)	71	(21)	143	(42)	107	(32)	8	(2)	2.84	0.86	229	5	(2)	44	(19)	100	(44)	70	(31)	10	(4)	0.493
k.	3.33	0.93	339	44	(13)	86	(25)	152	(45)	53	(16)	4	(1)	3.31	0.92	229	23	(10)	69	(30)	99	(43)	32	(14)	6	(3)	0.992

Difficulties

a. The school does not have a clear direction in developing ITEd
b. The school is not enthusiastic enough in promoting ITEd
c. The school is in lack of implementation plan which co-ordinates the work of the ITEd team
d. There are insufficient IT facilities in school
e. I do not have sufficient time to cope with the work of ITEd team
f. My IT knowledge/skills is/are inadequate to deal with work of ITEd team
g. Other team members lack a sense of involvement in ITEd works
h. Other teachers in school do not have sufficient time to adopt IT in teaching
i. Teachers generally lack knowledge/skills in applying IT in teaching
j. Teachers generally lack interest in using IT in teaching
k. There are insufficient IT facilities and digital resources from Education and Manpower Bureau

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.3.2 Activities to Promote IT Culture

School heads tended to be satisfied with the collaborative team work and sharing among teachers in the use of IT for teaching in schools

65% of them were satisfied or very satisfied that their schools continuously promoted collaborative team work and sharing among teachers in the use of IT for teaching in MS1. There was no statistically significant difference between MS1 and MS2 (Table 7.57, [S1]HSQ8d).

Table 7.57 School heads' levels of satisfaction with IT culture in schools ([S1]HSQ8d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school continuously promotes collaborative team work and sharing among teachers on the use of IT for teaching."									
MS1	3.70	0.65	397	29 (7)	232 (58)	124 (31)	12 (3)	0 (0)	0.889
MS2	3.69	0.62	354	21 (6)	213 (60)	110 (31)	10 (3)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Around one-third of schools (34%) organised sharing activities on the use of IT for teaching and 43% of those schools that collaborated with outside parties organised these activities with local schools in MS1

Table 7.58 ([S2]HQ17a-d) reports the situation of sharing activities in the use of IT for teaching in secondary schools. In MS1, 34% of school heads indicated that their schools had organised sharing activities for pedagogical use of IT in the 2004/05 school year ([S2]HQ17a). Amongst the 69% of school heads who had organised the sharing activities with outside parties ([S2]HQ17b), 43% organised with local primary, secondary and special schools, 30% with local community or commercial organisations and 27% with the EMB ([S2]HQ17c). The sharing activities were conducted in the forms of workshops (58%), training courses (44%), seminars (37%) and school visits (36%). Only 23% of the schools provided online Internet resources for sharing with other schools and 7% participated in the activities of "Teacher sharing forum" at the HKEdCity ([S2]HQ17d). In MS2, a statistically significant decrease was identified in the percentage of schools collaborating with outside parties when organised the sharing activities on the use of IT in learning and teaching (from 69% to 49%) and the percentage of schools conducting sharing activities in the forms of school visits (from 36% to 23%). Other than these, there was no statistically significant difference between MS1 and MS2 in this area.

Table 7.58 School heads' report on the sharing activities on the use of IT for teaching in their schools in the 2004/05 and 2005/06 school years ([S2]HQ17a-d)

Sharing activities	Percentage (%)		*P*-value
	MS1 (N=381)	MS2 (N=338)	
YES	34	40	0.145
NO	66	60	
Collaboration with other organisations	**(N=131)**	**(N=134)**	
YES	69	49	0.001**
NO	31	51	
Organisations	**(N=90)**	**(N=66)**	
Local primary, secondary, and special schools	43	29	0.064
Local community/commercial organisations	30	42	0.110
Education and Manpower Bureau	27	33	0.369
Local tertiary institutions	21	29	0.271
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	13	11	0.608
Oversea schools/community organisations/commercial organisations/tertiary institutions	4	5	0.976
Experience sharing activities	**(N=131)**	**(N=127)**	
Arranged workshop	58	60	0.766
Arranged training courses	44	46	0.725
Arranged seminars	37	38	0.948
Arranged school visits	36	23	0.022*
Provided online Internet resources for sharing with other schools	23	26	0.565
Participated in the activities of "Teacher sharing forum" at HKEdCity	7	13	0.121
Issued publications	6	2	0.137

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.3.3 Resources and Support

School heads were satisfied that their schools made appropriate use of resources

In MS1, 91% of school heads were satisfied or very satisfied that their schools made appropriate use of IT facilities and digital resources from the EMB, the Quality Education Fund and other sources. There was no statistically significant difference between MS1 and MS2 (Table 7.59, [S1]HSQ6j)

Table 7.59 School heads' levels of satisfaction with the use of resources ([S1]HSQ6j)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school makes appropriate use of IT facilities and digital resources from Education and Manpower Bureau, Quality Education Fund and other sources."									
MS1	4.17	0.59	397	106 (27)	253 (64)	36 (9)	2 (1)	0 (0)	0.058
MS2	4.08	0.60	354	77 (22)	232 (66)	43 (12)	2 (1)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

A statistically significant increase from 61% in MS1 to 84% in MS2 was noted in the percentage of schools receiving funding from the Quality Education Fund for IT-related projects

In order to provide resources and support for the implementation of school ITEd plans, secondary schools might need ITEd grants or funding from various sources. In MS1, schools received funding from the Quality Education Fund for IT-related projects (61%), Millennium Multi-media Classrooms Project (27%) and from other parties (8%) (Table 7.60, [S3]ITEdInfoQ2a). In MS2, a statistically significant increase was noted in the percentages of schools receiving funding from the Quality Education Fund for IT-related projects (from 61% to 84%) and Millennium Multi-media Classrooms Project (from 27% to 41%).

Table 7.60 Types of ITEd funding received by schools ([S3]ITEdInfoQ2a)

ITEd Funding	Percentage (%)		*P*-value
	MS1 (N=388)	MS2 (N=245)	
a. Quality Education Fund:			
- IT-related Projects [excluding Information Technology Co-ordinator (ITC), Multi-media Learning Centre (MMLC) and Matching Fund*]	61	84	0.000***
- Millennium Multi-media Classrooms Project (千禧多媒體課室計劃)	27	41	0.000***
b. Others	8	8	0.768

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

* Enhancement of IT facilities/services in school (matching fund)

School heads and ITEd Team Teachers were quite satisfied (一般) with the current funding model of the "Composite Information Technology Grant" — a statistically significant increase was noted in school heads' satisfaction level with this model in MS2

In MS1, 28% of school heads and 24% of the secondary ITEd team teachers were satisfied or very satisfied with the current funding model of the "Composite Information Technology Grant" (CITG) provided by the Government to support ITEd whereas 37% and 19% of them respectively were not satisfied or totally not satisfied with this funding model, with mean ratings of 2.93 (SD:0.93) and 3.03 (SD:0.76) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was identified in the satisfaction levels of the ITEd Team teachers in MS2, but a statistically significant increase (from 28% to 55%) was spotted in MS2 for the satisfaction levels of school heads (Table 7.61, [S2]HQ5, [S4]ITQ6).

Table 7.61 School heads' and ITEd Team teachers' levels of satisfaction to the current funding model of "Composite Information Technology Grant" (CITG) provided by the Government to support ITEd ([S2]HQ5, [S4]ITQ6)

Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
School heads	MS1	2.93	0.93	390	17	(4)	92	(24)	139	(36)	131	(34)	11	(3)	0.000***
	MS2	3.49	0.76	351	16	(5)	176	(50)	127	(36)	28	(8)	4	(1)	
ITEd team teachers	MS1	3.03	0.76	339	6	(2)	73	(22)	195	(58)	54	(16)	11	(3)	0.127
	MS2	3.12	0.88	228	10	(4)	63	(28)	110	(48)	35	(15)	10	(4)	

Mean: 1="Totally not satisfied" and 5="Very satisfied" Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.3.4 School Professional Development in ITEd for School Heads

School professional development programmes, such as IT leadership training for school principals organised by the EMB, help school heads to develop their positive perception of ITEd and empower them to build their knowledge, skills and understanding of learning and teaching with IT.

Around two-fifths of school heads participated in ITEd professional development programmes or activities

In MS1, around two-fifths of school heads (41%) reported having participated in ITEd professional development programmes or activities specifically organised for school heads. A statistically significant decrease (from 41% to 34%) was observed in school heads' participation in MS2 (Table 7.62, [S2]HQ18a).

"Using IT in school administration or managerial work" was the major theme that school heads expected for ITEd professional development programmes or activities

When asked about their expectation of the themes of ITEd professional development programmes or activities (Table 7.62, [S2]HQ18c), 72% of school heads in MS1 considered that using IT in school administration or managerial work should be included in these programmes. The next two themes were the formulation of school-based ITEd plan (54%) and using new technology in teaching (51%). Around 40% of the respondents indicated that the themes of IT facilities and digital resources management (37%) as well as using IT in subject or cross-curricular teaching (46%) should be incorporated. The theme of computer operation skills was selected by the lowest proportion of respondents amongst the specified themes (10%). No statistically significant difference was noted in MS2. As for the modes of professional development programmes or activities, the three most desirable modes rated by school heads in MS1 were "workshops" (72%), "training courses" (68%) and "school visits" (49%). "Training camps" (13%) was the least preferable mode amongst the specified modes ([S2]HQ18d). In MS2, a statistically significant decrease (from 72% to 65%) was identified in the percentage of school heads who chose "workshops" to be the desirable modes for ITEd professional development programmes or activities.

Table 7.62 School heads' expectations of the themes and modes as well as participation in ITEd professional development programmes or activities ([S2]HQ18a,c,d)

School heads' participation in school heads' ITEd professional development programme/activity	**Percentage (%)**		***P*-value**
	MS1 (N=373)	**MS2 (N=339)**	
YES	41	34	0.035*
NO	59	66	
Themes of ITEd professional development programmes/activities	**Expectation (N=390)**	**Expectation (N=343)**	
Use of IT in school administration/management work	72	73	0.612
Formulation of school-based ITEd plan	54	49	0.146
Use of new technology in teaching	51	50	0.642
Use of IT in subject/cross-curricular teaching	46	40	0.065
IT facilities and digital resources management	37	34	0.523
Computer operation skills	10	7	0.110
Others: (Please specify)	1	1	0.834
Modes of ITEd professional development programmes/activities	**Expectation (N=390)**	**Expectation (N=343)**	
Workshops	72	65	0.049*
Training courses	68	64	0.211
School visits	49	50	0.866
Special lectures	46	43	0.498
Seminars	45	44	0.880
Training camps	13	11	0.293
Others: (Please specify)	1	1	0.553

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

A statistically significant increase was noted in school heads' perceived level of effectiveness of the ITEd professional development programmes in helping their teaching, administration and managerial work in MS2

In MS1, 26% of school heads reported the ITEd professional development programmes as effective or very effective in helping their teaching, administration and managerial work whereas 34% of them rated them as not very effective or totally not effective, with a mean rating of 2.90 (SD:0.86) on a scale of 1 to 5 where 1 was 'totally not effective' and 5 was 'very effective'. A statistically significant increase (from 26% to 73%) was identified in school heads' perceived level of effectiveness of the ITEd professional development programmes or activities in MS2 (Table 7.63, [S2]HQ18b).

Table 7.63 School heads' perception of the effectiveness of the ITEd professional development programmes or activities ([S2]HQ18b)

	Mean (1-5)	**SD**	**N**	**Count (%) of School Heads choosing the option**					***P*-value**
				Very effective	**Effective**	**Quite effective (一般)**	**Not very effective**	**Totally not effective**	
MS1	2.90	0.86	154	2 (1)	38 (25)	61 (40)	48 (31)	5 (3)	0.000***
MS2	3.76	0.57	114	6 (5)	77 (68)	29 (25)	2 (2)	0 (0)	

Mean: 1="Totally not effective" and 5="Very effective"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.3.5 School Heads' Willingness to Promote ITEd

A statistically significant increase was noted in MS2 in school heads' level of willingness to allocate more time to promote ITEd

As school heads play a leading role in the promotion of ITEd in schools, their levels of willingness to allocate more time in this respect is surveyed. In MS1, it was found that they did not show high level of willingness to allocate more time for the promotion of ITEd in school. 35% of school heads were willing or very willing to do so whereas 43% of them were not willing or not willing at all to do so, with a mean rating of 2.93 (SD:1.04) on a scale of 1 to 5 where 1 was 'not willing at all' and 5 was 'very willing'. A statistically significant increase (from 35% to 76%) was identified in school heads' level of willingness to allocate more time to promote ITEd in MS2 (Table 7.64, [S2]HQ6).

Table 7.64 School heads' levels of willingness to allocate more time to promote ITEd ([S2]HQ6)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very willing	Willing	Quite willing (一般)	Not willing	Not willing at all	
MS1	2.93	1.04	390	23 (6)	112 (29)	86 (22)	153 (39)	16 (4)	0.000***
MS2	3.81	0.55	351	22 (6)	245 (70)	80 (23)	4 (1)	0 (0)	

Mean: 1="Totally not effective" and 5="Very effective"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.4 Enriching Digital Resources for Learning

The fourth strategic goal is "Enriching digital resources for learning". This strategy aims to continually enrich quality digital education resources to meet schools' needs and develop the digital resource repository with effective knowledge management strategies to facilitate learning, teaching and sharing among teachers, parents, students and other schools.

The usefulness of digital resources with respect to meeting the learning and teaching needs is reflected by the types of digital resources that are available, the frequency of usage and the ways in which these resources are managed. The following aspects will be examined:

- Sources of digital resources
- Digital resources repository

7.4.1 Sources of Digital Resources

School heads were satisfied that their schools acquired up-to-date digital resources for teachers and students' use

School heads' levels of satisfaction with enriching digital resources for learning is presented in Table 7.65 ([S1]HSQ6a-c). In MS1, nearly 80% of school heads (78%) were satisfied or very satisfied with the acquisition of up-to-date digital resources for teachers' and students' use. Around 50% of school heads were satisfied or very satisfied that their schools derived an effective digital resource management mechanism to facilitate learning and teaching as well as sharing among teachers, parents and students (53%) and developed quality school-based digital resources and a repository of online resources for all KLAs (51%). The mean ratings of these three items fell in the range of 3.48 to 3.91 (SD:0.70-0.80) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was found in school heads' level of satisfaction with all aspects mentioned above in MS2.

School heads considered the free digital resources downloaded from the Internet (except the HKEdCity) and those purchased by schools as the more important sources

School heads' perception of the importance of different sources of digital resources for learning and teaching is presented in Table 7.66 ([S2]HQ9a-j). In MS1, the three most important sources of digital resources were those purchased by schools (78%), those free resources downloaded from the Internet (except the HKEdCity) (78%) and those from the HKEdCity (72%). Around 60% of school heads indicated that the digital resources purchased by means of electronic Learning Credits (59%) and obtained from the Quality Education Fund (64%) as important or very important. 37% to 48% of them considered the digital resources purchased by or obtained via community resources (48%), those produced by teachers (44%) and those purchased from the funding of sponsoring bodies (37%) as important or very important. All of the above items had mean ratings ranged from 3.09 to 3.94 (SD:0.63-1.00) on a scale of 1 to 5 where 1 was 'totally not important' and 5 was 'very important'. A statistically significant decrease was noted in the percentages of school heads who considered digital resources purchased by means of the funding of sponsoring bodies (from 37% to 28%) and those obtained via community resources (from 48% to 38%) as important or very important in MS2.

The most common digital resources which teachers used frequently or very frequently were those provided by textbook publishers

When looking at the frequency of teachers using different digital resources (Table 7.67, [S5]TQ10a.i-xi), the most common resources which teachers used frequently or very frequently were provided by textbook publishers (50%), as reported in MS1. All other digital resources were frequently or very frequently used by less than 30% of the secondary school teachers, with mean ratings less than 3.00 on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. 24% to 29% of them frequently or very frequently used the digital resources developed by themselves (29%), free resources downloaded from the Internet (27%) and those purchased by schools (24%). 13% of them used digital resources from the HKEdCity and digital resources provided by other software vendor frequently or very frequently. Less than 10% of the respondents frequently or very frequently made use of the digital resources developed or provided by schools (9%), the EMB (8%), other government departments or voluntary organisations (7%) and tertiary institutions (7%). A statistically significant increase was found in the usage of digital resources developed by the teachers (from 29% to 33% used frequently or very frequently), the schools (from 9% to 12% used frequently or very frequently) in MS2 and a decrease in the usage of digital resources developed by other software vendors (from 40% to 37% used occasionally) was noted in MS2.

The most common digital resources assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours were free resources downloaded from the Internet

Table 7.68 ([S5]TQ10d) shows the sources of digital resources assigned by teachers for students to learn subject knowledge beyond school hours. The most common digital resources assigned for students as reported by teachers in MS1 were free resources downloaded from the Internet (except the HKEdCity) (54%), followed by the digital resources purchased by schools (32%). Less than 25% of the teachers assigned self-made digital resources (24%) and digital resources from the HKEdCity (20%). A statistically significant decrease was observed in MS2 in the percentages of teachers assigning digital resources purchased by schools (from 32% to 28%).

Students were asked to indicate the sources of digital resources that they used on their own initiative for self-learning beyond school hours (Table 7.68, [S6]SQ11c). In MS1, higher percentage of S6 (39%) than S2 and S4 students (24% and 26% respectively) indicated that they used free digital resources downloaded from the Internet (except the HKEdCity). 14% of S2, 19% of S4 and 18% of S6 students made use of teachers' self-made resources. In addition, 17% of S2, 13% of S4 and 15% of S6 students used digital resources from the HKEdCity. There was also a progressive decrease from S2 to S6 in the proportion of students using digital resources purchased by schools (21% of S2, 16% of S4 and 8% of S6). A statistically significant increase was observed in the percentages of all types of digital resources that students used on their own initiative for self-learning beyond school hours (MS1: S2=14%-24%, S4=16%-26% and S6=8%-39%; MS2: S2=30%-34%, S4=27%-35% and S6=15%-58%) except those from the HKEdCity in MS2.

Table 7.65 School heads' levels of satisfaction with enriching digital resources for learning ([S1]HSQ6a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		
a.	3.48	0.80	397	32	(8)	170	(43)	151	(38)	43 (11)	1 (0)	3.46	0.73	354	20	(6)	153	(43)	152	(43)	28 (8)	1 (0)	0.711
b.	3.54	0.74	397	31	(8)	179	(45)	161	(41)	25 (6)	1 (0)	3.58	0.73	354	31	(9)	165	(47)	137	(39)	21 (6)	0 (0)	0.450
c.	3.91	0.70	397	66	(17)	243	(61)	75	(19)	12 (3)	1 (0)	3.95	0.65	354	61	(17)	220	(62)	67	(19)	6 (2)	0 (0)	0.574

Aspects related to enriching digital resources for learning

a. The school has developed quality school-based digital resources and a repository of online resources for all key learning areas (KLAs).

b. The school has derived an effective mechanism for digital resource management to facilitate learning and teaching as well as sharing among teachers, parents and students.

c. The school from time to time acquires up-to-date digital resources for teachers'/students' use.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.66 School heads' perception of the importance of different sources of digital resources for learning and teaching ([S2]HQ9a-j)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very important		Important		Quite important (一般)		Not important				Very important		Important		Quite important (一般)		Not important		
a.	3.39	0.81	390	25	(6)	150	(38)	172	(44)	37 (9)	6 (2)	3.36	0.80	351	20	(6)	136	(39)	148	(42)	45 (13)	2 (1)	0.642
b.	3.94	0.63	390	64	(16)	240	(62)	84	(22)	2 (1)	0 (0)	3.86	0.66	351	49	(14)	210	(60)	89	(25)	1 (0)	2 (1)	0.142
c.	3.85	0.70	390	61	(16)	219	(56)	103	(26)	6 (2)	1 (0)	3.83	0.69	351	52	(15)	193	(55)	101	(29)	4 (1)	1 (0)	0.575
d.	3.94	0.66	390	67	(17)	236	(61)	82	(21)	5 (1)	0 (0)	3.92	0.65	351	58	(17)	211	(60)	78	(22)	4 (1)	0 (0)	0.719
e.	3.62	0.82	390	44	(11)	189	(48)	123	(32)	31 (8)	3 (1)	3.72	0.78	351	48	(14)	179	(51)	105	(30)	17 (5)	2 (1)	0.087
f.	2.64	0.98	390	9	(2)	62	(16)	148	(38)	120 (31)	51 (13)	2.67	0.97	351	12	(3)	51	(15)	134	(38)	116 (33)	38 (11)	0.799
g.	2.70	0.91	390	6	(2)	68	(17)	152	(39)	130 (33)	34 (9)	2.65	0.84	351	5	(1)	40	(11)	162	(46)	115 (33)	29 (8)	0.522
h.	3.09	1.00	390	20	(5)	125	(32)	146	(37)	69 (18)	30 (8)	2.89	1.04	351	18	(5)	82	(23)	132	(38)	83 (24)	36 (10)	0.005**
i.	3.30	0.96	390	26	(7)	161	(41)	125	(32)	60 (15)	18 (5)	3.15	1.01	351	26	(7)	109	(31)	127	(36)	68 (19)	21 (6)	0.020*
j.	3.67	0.93	390	63	(16)	188	(48)	99	(25)	28 (7)	12 (3)	3.60	0.93	351	52	(15)	154	(44)	105	(30)	31 (9)	9 (3)	0.179

Sources of digital resources for learning and teaching in school

a. Digital resources produced by teachers
b. Free digital resources downloaded from the Internet (except HKEdCity)
c. Digital resources from HKEdCity
d. Digital resources purchased by the school
e. Digital resources purchased by means of the "Electronic Learning Credit"
f. Digital resources purchased from parents' donations
g. Digital resources purchased by parents
h. Digital resources purchased from the funding of the sponsoring body
i. Digital resources purchased by/obtained via community resources (e.g. publishers and IT industries)
j. Digital resources obtained from Quality Education Fund

Mean: 1= "Totally not important" and 5="Very important; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.67 Teachers' frequency in using different digital resources ([S5]TQ10a.i-xi)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option								Mean (1-5)	SD	N	Count (%) of Teachers choosing the option								
				Very Frequently		Frequently		Occasionally (間中)		Rarely					Very Frequently		Frequently		Occasionally (間中)		Rarely		
i.	2.87	1.19	2726	293	(11)	493	(18)	903	(33)	643	(24)	394	(14)	3.01	1.20	2042	275	(13)	418	(20)	654	(32)	449	(22)	246	(12)	0.000***
ii.	2.25	0.95	2726	33	(1)	215	(8)	816	(30)	1011	(37)	651	(24)	2.34	1.00	2042	52	(3)	174	(9)	643	(31)	719	(35)	454	(22)	0.009**
iii.	2.93	0.90	2725	85	(3)	584	(21)	1309	(48)	558	(20)	189	(7)	2.93	0.93	2042	78	(4)	441	(22)	939	(46)	438	(21)	146	(7)	0.950
iv.	2.46	0.96	2725	41	(2)	293	(11)	1053	(39)	838	(31)	500	(18)	2.47	0.97	2041	43	(2)	209	(10)	775	(38)	653	(32)	361	(18)	0.980
v.	2.93	0.98	2726	128	(5)	600	(22)	1186	(44)	568	(21)	244	(9)	2.98	1.00	2043	132	(6)	436	(21)	906	(44)	403	(20)	166	(8)	0.094
vi.	2.34	0.88	2724	18	(1)	196	(7)	985	(36)	1024	(38)	501	(18)	2.39	0.93	2040	39	(2)	144	(7)	762	(37)	721	(35)	374	(18)	0.148
vii..	2.30	0.88	2723	19	(1)	165	(6)	980	(36)	1021	(37)	538	(20)	2.33	0.93	2040	33	(2)	135	(7)	717	(35)	741	(36)	414	(20)	0.598
viii.	2.25	0.89	2725	22	(1)	160	(6)	909	(33)	1031	(38)	603	(22)	2.29	0.95	2041	42	(2)	136	(7)	641	(31)	779	(38)	443	(22)	0.453
ix.	3.49	1.01	2725	449	(16)	939	(34)	935	(34)	301	(11)	101	(4)	3.45	1.03	2042	312	(15)	715	(35)	677	(33)	251	(12)	87	(4)	0.227
x.	2.53	0.95	2724	50	(2)	311	(11)	1094	(40)	838	(31)	431	(16)	2.47	0.98	2041	45	(2)	223	(11)	750	(37)	659	(32)	364	(18)	0.031*
xi.	1.73	1.19	132	6	(5)	8	(6)	20	(15)	9	(7)	89	(67)	1.46	0.88	149	1	(1)	6	(4)	15	(10)	16	(11)	111	(74)	0.091

Digital resources

i. Resources developed by yourself
ii. Resources developed by your school
iii. Resources purchased by your school
iv. HKEdCity
v. Free resources downloaded from the Internet
vi. Resources developed by Education and Manpower Bureau
vii. Resources provided by other government department(s)/voluntary organisation(s)
viii. Tertiary institution(s)
ix. Resources provided by textbook publisher(s)
x. Resources developed by other software vendor(s)
xi. Others (Please specify: _____)

Mean: 1= "Totally not important" and 5="Very important; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.68 Digital resources assigned by teachers for students to learn subject knowledge and used by students on their own initiative for self-learning beyond school hours ([S5]TQ10d, [S6]SQ11c)

Digital Resources	Percentage (%) choosing the options											
	Digital resources which students used on their own initiative for self-learning beyond school hours									Digital resources which teachers assigned students to use for learning subject knowledge beyond school hours		
	S2			S4			S6			Teachers		
	MS1 (N=977)	MS2 (N=588)	*P*-value	MS1 (N=881)	MS2 (N=520)	*P*-value	MS1 (N=838)	MS2 (N=453)	*P*-value	MS1 (N=1836)	MS2 (N=1251)	*P*-value
Free digital resources downloaded from the Internet (except HKEdCity)	24	34	0.000***	26	35	0.000***	39	58	0.000***	54	55	0.377
Digital resources purchased by the school	21	30	0.000***	16	27	0.000***	8	15	0.000***	32	28	0.011*
Self-made digital resources by the teachers	14	30	0.000***	19	34	0.000***	18	32	0.000***	24	25	0.731
Digital resources from HKEdCity	17	19	0.142	13	17	0.026*	15	15	0.802	20	21	0.312
Others	57	10	0.000***	60	13	0.000***	54	10	0.000***	21	20	0.418

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

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Teachers and students tended to perceive that the digital resources were helpful for students' learning

Concerning the helpfulness of digital resources for learning, no matter they were assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours, 39% to 41% of S2, 37% to 41% of S4 and 34% to 36% of S6 students found them to be helpful or definitely helpful in MS1. The mean ratings fell in the range of 3.17 to 3.31 (SD:0.76-0.87) on a scale of 1 to 5 where 1 was 'definitely not' and 5 was 'yes definitely' (Table 7.69, [S6]SQ10d,11d). On the other hand, 50% of the teachers considered the digital resources which they assigned to students to be helpful or definitely helpful for students' learning of the subject content, with a mean rating of 3.50 (SD:0.58) (Table 7.69, [S5]TQ10e). A statistically significant increase was observed in students' perceived level of the helpfulness of digital resources assigned by teachers for learning subject knowledge (MS1: 36%-41%; MS2: 54%-56%) and those used for their initiative for self-learning beyond school hours (MS1: 34%-41%; MS2: 54%-58%) in MS2.

Table 7.69 Teachers' and students' perception of the helpfulness of digital resources assigned by teachers for learning subject knowledge/used by students on their own initiative for self-learning beyond school hours ([S5]TQ10e, [S6]SQ10d,11d)

Class levels/Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option								*P*-value
					Yes definitely		Yes		Maybe (一般)		No		Definitely not		
Levels of helpfulness of the digital resources assigned by teachers for learning subject knowledge beyond school hours													
S2	MS1	3.27	0.84	909	53	(6)	296	(33)	427	(47)	112	(12)	20	(2)	0.000***
	MS2	3.59	0.78	610	60	(10)	283	(46)	230	(38)	30	(5)	6	(1)	
S4	MS1	3.31	0.80	686	32	(5)	250	(36)	317	(46)	74	(11)	14	(2)	0.000***
	MS2	3.58	0.75	446	40	(9)	206	(46)	180	(40)	14	(3)	6	(1)	
S6	MS1	3.19	0.81	508	16	(3)	166	(33)	229	(45)	88	(17)	8	(2)	0.000***
	MS2	3.57	0.70	387	29	(8)	178	(46)	165	(43)	13	(3)	2	(0)	
Teachers	MS1	3.50	0.58	1836	44	(2)	877	(48)	876	(48)	37	(2)	2	(0)	0.980
	MS2	3.50	0.59	1251	28	(2)	602	(48)	593	(47)	24	(2)	4	(0)	
Levels of helpfulness of the digital resources used on students' initiative for self-learning beyond school hours															
S2	MS1	3.30	0.87	977	69	(7)	328	(34)	428	(44)	127	(13)	25	(3)	0.000***
	MS2	3.66	0.79	588	79	(13)	264	(45)	216	(37)	22	(4)	6	(1)	
S4	MS1	3.28	0.76	881	36	(4)	293	(33)	447	(51)	95	(11)	11	(1)	0.000***
	MS2	3.63	0.77	520	64	(12)	228	(44)	206	(40)	19	(4)	3	(1)	
S6	MS1	3.17	0.83	838	31	(4)	252	(30)	406	(49)	125	(15)	24	(3)	0.000***
	MS2	3.58	0.69	453	34	(7)	213	(47)	190	(42)	15	(3)	1	(0)	

Mean: 1="Definitely not" and 5="Yes definitely"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers tended to consider digital resources in schools as sufficient whereas students considered them as quite sufficient (一般)

With regard to the sufficiency of digital resources in schools (e.g. educational CDs and learning resources from the Internet), around one quarter of the students (28% of S2, 26% of S4 and 22% of S6) indicated that it was sufficient or very sufficient, while about one quarter of the students (22% of S2, 22% of S4 and 27% of S6) rated them as insufficient or totally insufficient in MS1. The mean ratings for S2, S4 and S6 students were 3.05 (SD:0.90), 3.04 (SD:0.87) and 2.94 (SD:0.86) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. In MS2, a statistically significant increase was noted in S2 (from 28% to 35%) and S6 (from 22% to 23%) students' perceived level of the sufficiency of digital resources in schools (Table 7.70, [S6]SQ7f). From the teachers' point of view, 35% of the teachers in MS1 considered that the digital resources were sufficient or very sufficient whereas only 17% of the teachers claimed that the digital resources were insufficient or totally insufficient, with a mean rating of 3.54 (SD:1.11). No statistically significant difference was identified in teachers' perceived level of the sufficiency of digital resources in schools in MS2 (Table 7.70, [S5]TQ7g). The findings indicated that teachers' perceived level of the sufficiency of digital resources in schools was higher than that of the students.

Table 7.70 Students' and teachers' perception of the sufficiency of digital resources in schools ([S5]TQ7g, [S6]SQ7f)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
S2	MS1	3.05	0.90	2274	93	(4)	551	(24)	1138	(50)	353	(16)	139	(6)	0.000***
	MS2	3.19	0.87	1852	87	(5)	559	(30)	908	(49)	207	(11)	91	(5)	
S4	MS1	3.04	0.87	2176	96	(4)	474	(22)	1126	(52)	375	(17)	105	(5)	0.306
	MS2	3.05	0.90	1803	63	(4)	465	(26)	881	(49)	279	(15)	114	(6)	
S6	MS1	2.94	0.86	1723	63	(4)	314	(18)	881	(51)	383	(22)	82	(5)	0.005**
	MS2	2.98	0.82	1426	32	(2)	301	(21)	771	(54)	256	(18)	66	(5)	
Teachers	MS1	3.54	1.11	2727	45	(2)	901	(33)	1304	(48)	416	(15)	61	(2)	0.074
	MS2	3.61	1.07	2045	60	(3)	677	(33)	992	(49)	266	(13)	50	(2)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Secondary schools were quite in need of increasing or upgrading digital resources as perceived by ITEd Team teachers

In MS1, 66% of the ITEd Team teachers indicated that their schools were quite in need or much in need of increasing or upgrading digital resources, which was the second greatest support needed by the secondary schools. There was no statistically significant difference in MS2 (Table 7.71, [S4]ITQ5d).

Table 7.71 ITEd Team teachers' perception of the needs of different types of support for teachers and students in school ([S4]ITQ5d)

	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option										*P*-value
				Much in need		Quite in need		Average		Not much in need		No need at all		
"To increase/upgrade digital resources"														
MS1	3.86	0.86	339	86	(25)	138	(41)	100	(29)	13	(4)	2	(1)	0.577
MS2	3.82	0.87	228	52	(23)	98	(43)	63	(28)	14	(6)	1	(0)	

Mean: 1= "No need at all" and 5="Much in need"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Lack of suitable digital resources was one of the major problems that schools encountered when implementing school ITEd plans as perceived by school heads

In MS1, school heads indicated that the lack of suitable educational software or digital resources (42%) was the problem that schools often or most often encountered when implementing school ITEd plans (Table 7.72, [S2]HQ3l). The major difficulty that ITEd Team teachers frequently or very frequently encountered was "insufficient IT facilities and digital resources from the EMB" (38%) in MS1. No statistically significant difference was identified in school heads' and ITEd Team teachers' perceived frequency of difficulties encountered in implementing of ITEd plan in this area in MS2 (Table 7.72, [S4]ITQ4k).

Table 7.72 School heads' and ITEd Team teachers' perceived frequency of difficulties encountered in implementing of ITEd plan ([S2]HQ3l, [S4]ITQ4k)

Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Most often		Often		Occasionally (間中)		Rarely		Never		
"Lacking in suitable educational software/digital resources" (Mean: 1="Never" and 5="Most often")															
School heads	MS1	3.32	1.00	390	51	(13)	114	(29)	145	(37)	69	(18)	11	(3)	0.088
	MS2	3.20	0.99	351	36	(10)	94	(27)	135	(38)	75	(21)	11	(3)	
		Mean (1-5)	**SD**	**N**	**Count (%) choosing the option**										***P*-value**
					Very Frequently		**Frequently**		**Occasionally (間中)**		**Rarely**		**Never**		
"There are insufficient IT facilities and digital resources from Education and Manpower Bureau" (Mean: 1="Never" and 5="Very frequently")															
ITEd team teachers	MS1	3.33	0.93	339	44	(13)	86	(25)	152	(45)	53	(16)	4	(1)	0.992
	MS2	3.31	0.92	229	23	(10)	69	(30)	99	(43)	32	(14)	6	(3)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.4.2 Digital Resources Repository

Schools have to keep a wide variety of high quality digital resources which should be well gathered and managed for easy sharing, retrieval and utilization. This section examines two digital resources repository platforms: school e-learning platforms and the HKEdCity, in terms of the learning effectiveness and satisfaction level of the services provided.

7.4.2.1 School e-Learning Platforms

e-Learning platform is a learning system developed within the environment of the Internet or intranet which provides various learning tools such as learning material download, assignment submission, online tests, learning records etc.

Around one-third of the teachers and 30% to 45% of the students used e-learning platforms for teaching or learning — a statistically significant decrease was noted in the students' usage of e-learning platforms for learning in MS2

With regard to the usage of e-learning platforms, around one-third of the secondary school teachers (32%) used them for teaching (Table 7.73, [S5]TQ11a). 45% of S2, 39% of S4 and 30% of S6 students indicated that they used them for learning (Table 7.73, [S6]SQ12a). A statistically significant decrease was noted in the percentages of students using e-learning platforms for learning (MS1: 30%-45%; MS2: 23%-39%) in MS2 and there was no statistically significant difference in those for teachers in MS2.

In terms of the frequency of usage, 66% of S2, 61% of S4 and 64% of S6 respondents visited school e-learning platforms 1 to 10 times while 23% of S2, 26% of S4 and 22% of S6 students respectively reported using it 11 times or more during the week prior to the conduct of the questionnaire survey in MS1 (Table 7.73, [S6]SQ12b). 71% and 11% of the teachers used e-learning platforms to conduct teaching 1 to 10 times and 11 times or more respectively during the week prior to the conduct of the questionnaire survey in MS1 (Table 7.73, [S5]TQ11b). A statistically significant difference in the distribution of the frequency in using e-learning platforms for students and in that for teachers was noted in MS2. There was a decrease in the usage of students using e-learning platforms 11 times or more (MS1:5%-18%; MS2:3%-7%) while an increase was observed in the percentages of teachers using e-learning platforms 5 times or more (MS1: 4%-18%; MS2: 8%-20%) in MS2.

Students and teachers generally agreed that e-learning platforms could help students' learning — a statistically significant increase was noted in students' level of agreement on the helpfulness of e-learning platforms to their learning in MS2

Regarding the learning effectiveness of e-learning platforms, as reported in MS1, around 30% of the students (33% of S2, 30% of S4 and 26% of S6) agreed or strongly agreed that e-learning platforms could help their learning while 16%, 12% and 17% of them disagree or strongly disagreed with this. The mean ratings for S2, S4 and S6 students were 3.18 (SD:0.84), 3.21 (SD:0.76) and 3.07 (SD:0.73) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 7.74, [S6]SQ12d). Teachers perceived similar level of agreement on the learning effectiveness of e-learning platforms. 26% of the secondary school teachers agreed or strongly agreed that the use of e-learning platforms could help students in their learning whereas 13% disagreed or strongly disagreed on this item, with a mean rating of 3.11 (SD:0.68) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'(Table 7.74, [S5]TQ11d). In MS2, a statistically significant increase was observed in students' level of agreement on the helpfulness of e-learning platforms (MS1: 26%-33%; MS2: 34%-41%). No statistically significant difference was observed in teachers' side.

Table 7.73 The usage of e-learning platforms to conduct teaching / learning by teachers and students during the week prior to the conduct of the questionnaire survey ([S6]SQ12a,b [S5]TQ11a,b)

	Percentage (%) choosing the option															
	S2		*P*-value		S4		*P*-value		S6		*P*-value		Teachers		*P*-value	
	MS1 (N=2262)	MS2 (N=1826)			MS1 (N=2171)	MS2 (N=1767)			MS1 (N=1724)	MS2 (N=1411)			MS1 (N=2633)	MS2 (N=1965)		
Yes	45	39			39	31			30	23			32	32		
No	55	61	0.000*** [a]		61	69	0.000*** [a]		70	77	0.000*** [a]		68	68	0.691 [a]	
Frequency	**(N=1025)**	**(N=712)**	**χ^2 (df=4)**	***P*-value**	**(N=839)**	**(N=551)**	**χ^2 (df=4)**	***P*-value**	**(N=520)**	**(N=331)**	**χ^2 (df=4)**	***P*-value**	**(N=831)**	**(N=631)**	**χ^2 (df=4)**	***P*-value**
16 times or above	7	7			8	7			5	3			4	8		
11 to 15 times	16	6			18	5			17	3			7	8		
5 to 10 times	24	18	54.93	0.000*** [b]	19	21	70.34	0.000*** [b]	21	18	51.05	0.000*** [b]	18	20	14.19	0.007** [b]
1 to 4 times	42	54			42	43			43	56			53	47		
Nil	11	15			13	24			14	20			19	18		

[a.]Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.]Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.74 Teachers' and students' levels of agreement on the helpfulness of e-learning platforms to students' learning ([S5]TQ11d, [S6]SQ12d)

Class levels/Stakeholders		**Mean (1-5)**	**SD**	**N**	**Count (%) choosing the option**										***P*-value**
					Strongly agree		**Agree**		**Average**		**Disagree**		**Strongly disagree**		
S2	MS1	3.18	0.84	1025	49	(5)	287	(28)	520	(51)	135	(13)	35	(3)	0.000***
	MS2	3.39	0.77	712	52	(7)	239	(34)	370	(52)	39	(5)	12	(2)	
S4	MS1	3.21	0.76	839	38	(4)	218	(26)	481	(57)	86	(10)	16	(2)	0.000***
	MS2	3.37	0.77	551	43	(8)	169	(31)	296	(54)	37	(7)	6	(1)	
S6	MS1	3.07	0.73	520	4	(1)	132	(25)	296	(57)	75	(14)	14	(3)	0.002**
	MS2	3.21	0.77	331	8	(2)	106	(32)	172	(52)	35	(11)	9	(3)	
Teachers	MS1	3.11	0.68	2657	18	(1)	661	(25)	1639	(62)	272	(10)	67	(3)	0.668
	MS2	3.13	0.67	1949	27	(1)	456	(23)	1246	(64)	181	(9)	39	(2)	

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students were quite satisfied (一般) with the services provided by school e-learning platforms — a statistically increase was noted in students' level of satisfaction with the services provided by school e-learning platforms in MS2

Students were asked to comment on the speed of downloading or uploading information and the degree of convenience in searching learning content (Table 7.75, [S6]SQ12e). In MS1, about 30% of the students (31% of S2, 30% of S4 and 30% of S6) were satisfied or very satisfied with the services provided by school e-learning platforms, while 19%, 13% and 18% of them were not satisfied or totally not satisfied with the services provided by e-learning platforms. The mean ratings of the item were 3.13 (SD:0.88), 3.19 (SD:0.76) and 3.12 (SD:0.78) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. A statistically significant increase was observed in students' level of satisfaction with the services provided by e-learning platforms (MS1: 30%-31%; MS2: 31%-40%) in MS2.

Table 7.75 Students' levels of satisfaction with the services provided by school e-learning platforms ([S6]SQ12e)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the services provided by the e-learning platform															
S2	MS1	3.13	0.88	1025	52	(5)	271	(26)	511	(50)	142	(14)	49	(5)	0.000***
	MS2	3.35	0.83	712	53	(7)	233	(33)	357	(50)	49	(7)	21	(3)	
S4	MS1	3.19	0.76	839	35	(4)	215	(26)	483	(58)	90	(11)	16	(2)	0.002**
	MS2	3.32	0.82	551	45	(8)	157	(28)	288	(52)	50	(9)	11	(2)	
S6	MS1	3.12	0.78	520	14	(3)	138	(27)	273	(53)	82	(16)	12	(2)	0.044*
	MS2	3.19	0.74	331	9	(3)	93	(28)	192	(58)	27	(8)	9	(3)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived a higher level of proficiency in using e-learning platforms than teachers — a statistically significant increase was noted in students' and teachers' self-evaluated level of proficiency in using e-learning platforms in MS2

With respect to the proficiency of teachers and students in using e-learning platforms, it was notable that in MS1 only 18% of the teachers rated themselves as proficient or highly proficient and 41% rated not proficient or knowing nothing about using these resources at all, with a mean rating of 2.66 (SD:0.98) on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient' (Table 7.76, [S5]TQ11c). It was noteworthy that a higher level of proficiency in this aspect was reported by students. 40% of S2, 37% of S4 and 31% of S6 students claimed that they were proficient or highly proficient in using the platforms, with mean ratings of 3.23 (SD:0.99), 3.23 (SD:0.90) and 3.08 (SD:0.90) respectively on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient' (Table 7.76, [S6]SQ12c). A statistically significant increase was noted in students' (MS1: 31%-40%; MS2: 38%-50%) and teachers' (from 18% to 19%) self-evaluated levels of proficiency in using e-learning platforms in MS2.

Table 7.76 Teachers' and students' self-evaluated proficiency in using e-learning platforms ([S5]TQ11c, [S6]SQ12c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		
Levels of proficiency in using e-learning platform															
S2	MS1	3.23	0.99	1025	92	(9)	320	(31)	396	(39)	166	(16)	52	(5)	0.000***
	MS2	3.48	0.86	712	73	(10)	284	(40)	280	(39)	62	(9)	13	(2)	
S4	MS1	3.23	0.90	839	54	(6)	263	(31)	376	(45)	116	(14)	31	(4)	0.019*
	MS2	3.36	0.89	551	52	(9)	182	(33)	243	(44)	59	(11)	14	(3)	
S6	MS1	3.08	0.90	520	26	(5)	135	(26)	236	(45)	102	(20)	21	(4)	0.004**
	MS2	3.24	0.89	331	22	(7)	103	(31)	147	(45)	48	(14)	10	(3)	
Teachers	MS1	2.66	0.98	2657	60	(2)	434	(16)	1083	(41)	714	(27)	366	(14)	0.016*
	MS2	2.74	0.93	1948	43	(2)	324	(17)	862	(44)	512	(26)	207	(11)	

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.4.2.2 Educational e-Portal: Hong Kong Education City (HKEdCity)

Hong Kong Education City (www.hkedcity.net) is strongly promoted by the EMB as one of the online digital resources repository to support learning and teaching. It serves to provide quality digital resources for teachers, students, schools and the community.

Nearly half of the students and 57% of the teachers visited the HKEdCity in MS1 – a statistically significant decreased usage by students was noted in MS2

In MS1, nearly half of the students (49% of S2, 50% of S4 and 49% of S6) reported to have visited the HKEdCity (Table 7.77, [S6]SQ13a). Of these, 48% of S2, 37% of S4 and 34% of S6 respondents visited it 1 to 10 times during the week prior to the conduct of the questionnaire survey. 23% of S2, 26% of S4 and 23% of S6 respectively reported using it 11 times a week or more. A statistically significant decrease was noted in the percentages of S4 (from 50% to 44%) and S6 students (from 49% to 44%) having visited the HKEdCity and a statistically significant decrease in frequency of students using the HKEdCity (MS1: 8%-15%; and MS2: 1%-5% for 11 times or more) in MS2 (Table 7.77, [S6]SQ13b).

The usage by teachers, on the other hand, was reported to be relatively higher. 57% of the teachers reported that they made use of it to assist their teaching (Table 7.77, [S5]TQ13a). Among them, 69% and 4% used it 1 to 10 times and 11 times or more respectively during the week prior to the conduct of the questionnaire survey (Table 7.77, [S5]TQ13b). There was no statistically significant difference in the percentage of teachers visiting the HKEdCity and in their frequency of usage in MS2.

Students were quite satisfied (一般) with the services provided by the HKEdCity

When examining their opinions about the services provided by the HKEdCity, around a quarter of the students (28% of S2, 26% of S4 and 24% of S6) in MS1 were satisfied or very satisfied with the speed of downloading or uploading information and the degree of convenience in searching learning content provided by this website, with mean ratings of 3.14 (SD:0.83), 3.13 (SD:0.79) and 3.09 (SD:0.76) respectively on a scale of 1 to 5 where 1 was ‘totally not satisfied’ and 5 was ‘very satisfied’ (Table 7.78, [S6]SQ13e). A statistically significant increase was noted in S2 students’ level of satisfaction with the services provided at the HKEdCity (from 28% to 33%) in MS2.

Students perceived that learning contents of the HKEdCity were occasionally updated

Around a quarter of the students (28% of S2, 26% of S4 and 22% of S6) in MS1 considered that the learning contents of the HKEdCity were frequently or very frequently updated, with mean ratings of 3.08 (SD:0.90), 3.09 (SD:0.84) and 2.98 (SD:0.85) respectively on a scale of 1 to 5 where 1 was ‘never’ and 5 was ‘very frequently’ (Table 7.79, [S6]SQ13f). There was no statistically significant difference in this area in MS2.

Table 7.77 The usage of the HKEdCity by teachers and students during the week prior to the conduct of the questionnaire survey ([S5]TQ13a,b, [S6]SQ13a,b)

	Percentage (%) choosing the option											
	S2		*P*-value	S4		*P*-value	S6		*P*-value	Teachers		*P*-value
	MS1 (N=2269)	MS2 (N=1816)		MS1 (N=2173)	MS2 (N=1786)		MS1 (N=846)	MS2 (N=1410)		MS1 (N=2720)	MS2 (N=2039)	
Yes	49	46		50	44		49	44		57	53	
No	51	54	0.386 [a]	50	56	0.000*** [a]	51	56	0.003** [a]	43	47	0.025 [a]

Frequency	(N=1112)	(N=844)	$\chi^2_{(df=4)}$	*P*-value	(N=1082)	(N=780)	$\chi^2_{(df=4)}$	*P*-value	(N=846)	(N=626)	$\chi^2_{(df=4)}$	*P*-value	(N=1534)	(N=1090)	$\chi^2_{(df=4)}$	*P*-value
16 times or above	11	5			14	4			15	1			1	2		
11 to 15 times	12	3			12	3			8	1			3	4		
5 to 10 times	9	9	87.29	0.000*** [b]	7	10	112.48	0.000*** [b]	5	5	135.77	0.000*** [b]	15	13	9.00	0.061 [b]
1 to 4 times	39	44			30	38			29	34			54	54		
Nil	29	39			37	45			43	60			28	27		

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.78 Students' levels of satisfaction with the services provided by the HKEdCity ([S6]SQ13e)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the services provided at the HKEdCity (Mean: 1="Totally not satisfied" and 5="Very satisfied")															
S2	MS1	3.14	0.83	1112	55	(5)	261	(23)	634	(57)	114	(10)	48	(4)	0.011*
	MS2	3.24	0.83	844	51	(6)	226	(27)	470	(56)	64	(8)	33	(4)	
S4	MS1	3.13	0.79	1082	54	(5)	226	(21)	648	(60)	119	(11)	35	(3)	0.127
	MS2	3.18	0.82	780	48	(6)	177	(23)	451	(58)	78	(10)	25	(3)	
S6	MS1	3.09	0.76	846	33	(4)	165	(20)	525	(62)	96	(11)	27	(3)	0.171
	MS2	3.02	0.78	626	13	(2)	127	(20)	374	(60)	81	(13)	30	(5)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.79 Students' perceived frequency for updating the learning content at the HKEdCity ([S6]SQ13f)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never		
Frequency for updating the learning content at the HKEdCity (Mean: 1="Never" and 5="Very frequently")															
S2	MS1	3.08	0.90	1112	66	(6)	240	(22)	576	(52)	173	(16)	57	(5)	0.293
	MS2	3.12	0.90	844	53	(6)	189	(22)	450	(53)	106	(13)	46	(5)	
S4	MS1	3.09	0.84	1082	54	(5)	222	(21)	617	(57)	142	(13)	47	(4)	0.383
	MS2	3.04	0.92	780	46	(6)	155	(20)	422	(54)	103	(13)	55	(7)	
S6	MS1	2.98	0.85	846	30	(3)	159	(19)	473	(56)	137	(16)	48	(6)	0.344
	MS2	2.95	0.82	626	11	(2)	127	(20)	341	(54)	112	(18)	35	(6)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers and students perceived that the learning materials provided by the HKEdCity were generally suitable (一般) for students

When asked about the suitability of learning materials provided by the HKEdCity, teachers were more positive than students. In MS1, 37% of the teachers considered the learning materials provided by this website as suitable or very suitable for their students, with a mean rating of 3.31 (SD:0.66) on a scale of 1 to 5 where 1 was 'totally not suitable' and 5 was 'very suitable' (Table 7.80, [S5]TQ13c). As for the students, around a quarter of them (26% of S2, 26% of S4 and 22% of S6) found the materials as suitable or very suitable for their learning whereas 20%, 18% and 24% of S2, S4 and S6 students respectively found them not suitable or totally not suitable, with mean ratings of 3.07 (SD:0.86), 3.07 (SD:0.79) and 2.95 (SD:0.83) respectively (Table 7.80, [S6]SQ13c). A statistically significant increase was noted in S2 students' perceived level of the suitability of learning materials provided by the HKEdCity for students (from 26% to 32%) while a statistically significant decrease was noted in that of S6 (from 22% to 17%) in MS2.

Table 7.80 Teachers' and students' perceived levels of suitability of the learning materials provided by the HKEdCity for students ([S5]TQ13c, [S6]SQ13c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very suitable		Suitable		Quite suitable (一般)		Not suitable		Totally not suitable		
Levels of suitability of the learning materials provided by the HKEdCity for students (Mean: 1="Totally not suitable" and 5="Very suitable")															
S2	MS1	3.07	0.86	1112	54	(5)	234	(21)	609	(55)	164	(15)	52	(5)	0.000***
	MS2	3.20	0.87	844	52	(6)	223	(26)	447	(53)	83	(10)	39	(5)	
S4	MS1	3.07	0.79	1082	33	(3)	245	(23)	607	(56)	160	(15)	37	(3)	0.600
	MS2	3.09	0.85	780	35	(4)	183	(24)	409	(52)	121	(16)	31	(4)	
S6	MS1	2.95	0.83	846	20	(2)	168	(20)	455	(54)	160	(19)	43	(5)	0.003**
	MS2	2.82	0.82	626	8	(1)	102	(16)	323	(52)	155	(25)	38	(6)	
Teachers	MS1	3.31	0.66	1543	21	(1)	561	(36)	852	(55)	91	(6)	18	(1)	0.135
	MS2	3.28	0.67	1090	23	(2)	356	(33)	623	(57)	77	(7)	11	(1)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers and parents tended to perceive the HKEdCity to be effective in assisting students' learning whereas students perceived the website to be quite effective (一般) in doing so

In terms of the learning effectiveness of the HKEdCity, 37% of the teachers and around a quarter of the students (24% of S2, 25% of S4 and 23% of S6) as well as 32% of the parents in MS1 considered the HKEdCity to be effective or very effective in assisting their students' learning, with mean ratings of 3.31 (SD:0.64), 3.04 (SD:0.86), 3.08 (SD:0.79), 2.98 (SD:0.84) and 3.30 (SD:0.59) on a scale of 1 to 5 where 1 was 'totally not effective' and 5 was 'very effective' (Table 7.81, [S5]TQ13d, [S6]SQ13d, [S7]PQ10c). A statistically significant increase was noted in S2 students' perceived level of effectiveness of the HKEdCity in assisting students' learning (from 24% to 31%) whereas a statistically significant decrease was noted in those of S6 (from 23% to 16%) in MS2.

Table 7.81 Teachers', students' and parents' perception of the effectiveness of the HKEdCity in assisting students' learning ([S5]TQ13d, [S6]SQ13d, [S7]PQ10c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very effective		Effective		Quite effective (一般)		Not effective		Totally not effective		
Levels of effectiveness of the HKEdCity in assisting students' learning (Mean: 1="Totally not effective" and 5="Very effective")															
S2	MS1	3.04	0.86	1112	59	(5)	210	(19)	613	(55)	179	(16)	50	(5)	0.001***
	MS2	3.15	0.87	844	47	(6)	210	(25)	446	(53)	100	(12)	40	(5)	
S4	MS1	3.08	0.79	1082	40	(4)	225	(21)	629	(58)	154	(14)	34	(3)	0.935
	MS2	3.07	0.84	780	37	(5)	164	(21)	429	(55)	117	(15)	32	(4)	
S6	MS1	2.98	0.84	846	24	(3)	169	(20)	459	(54)	150	(18)	44	(5)	0.000***
	MS2	2.79	0.85	626	9	(1)	95	(15)	325	(52)	146	(23)	50	(8)	
Parents	MS1	3.30	0.59	1926	44	(2)	581	(30)	1215	(63)	83	(4)	3	(0)	0.132
	MS2	3.33	0.62	1266	39	(3)	406	(32)	764	(60)	57	(5)	1	(0)	
Teachers	MS1	3.31	0.64	1543	21	(1)	548	(36)	875	(57)	83	(5)	16	(1)	0.183
	MS2	3.28	0.65	1090	24	(2)	353	(32)	627	(58)	81	(7)	5	(0)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

The fifth strategic goal of the Second ITEd Strategy is "Improving IT infrastructure and pioneering pedagogy using IT". The progress of IT infrastructure improvement is tracked in terms of the sufficiency of serviceable IT facilities and technical support for students and teachers, especially with the new technology to support innovative pedagogy to enhance learning and teaching.

The following sections examine the extent of IT infrastructure development in surveyed secondary schools in three aspects:

- Access and connectivity in schools
- Management and maintenance of IT facilities and technical support services
- Upgrading IT facilities and exploring advanced IT technology

7.5.1 Access and Connectivity in Schools

School heads were satisfied that their schools provided sound and sufficient IT facilities for students and teachers

Schools should be able to provide students and teachers with good serviceable computers and other IT facilities, well-maintained school network for communication and access to multimedia-rich content inside school as well as sufficient bandwidth for the connection to the Internet at all times. 82% of school heads were satisfied or very satisfied that their schools provided sound and sufficient IT facilities for students and teachers in MS1. No statistically significant difference was identified in this area in MS2 (Table 7.82, [S1]HSQ6d).

Table 7.82 School heads' levels of satisfaction with the provision of IT infrastructure ([S1]HSQ6d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school provides sound and sufficient IT facilities for students and teachers."									
MS1	4.03	0.68	397	88 (22)	239 (60)	62 (16)	8 (2)	0 (0)	0.344
MS2	4.08	0.60	354	78 (22)	229 (65)	45 (13)	2 (1)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.5.1.1 Quantities and Locations of Hardware

Hardware was improved in secondary schools — the number of digital projectors in classrooms increased

With extensive input and support from the EMB under the Five-year Strategy, fundamental IT infrastructure has been well set up in schools. Table 7.83 ([S3]ITEdInfoQ3a.i-ii) lists out the average number of different types of hardware in secondary schools. In MS1, the numbers of desktop and notebook computers per school were 198.16 and 72.25 respectively. The average number of video broadcasting systems was 0.46. 71% of schools reported having at least 1 wireless LAN in schools ([S3]ITEdInfoQ3aii_1). The numbers of digital projectors for mobile use and that for fixed installation were 2.94 and 33.76 respectively. Regarding the provision of electronic whiteboards, there were an average of 0.35 for mobile use and 0.34 for fixed installation per secondary school ([S3]ITEdInfoQ3a,4). In MS2, the numbers of desktop computers (from 198.16 to 209.46), video

broadcasting systems (from 0.46 to 0.78), electronic whiteboards for fixed installation (from 0.34 to 0.54) and digital projectors for mobile use (from 2.94 to 3.03) and for fixed installation (from 33.76 to 36.00) per school significantly increased statistically. On the other hand, the average number of notebook computers per school significantly decreased statistically (from 72.25 to 64.32).

As mentioned in the Overall Study, the IT facilities in different locations, especially in classrooms, provided the convenience of IT integration for learning and teaching. This survey has enquired about the locations of IT facilities, including computers, digital projectors and electronic whiteboards. As seen from Table 7.83 ([S3]ITEdInfoQ4a-g), an average of 17.19 computers (including desktop and notebook) per secondary school allocated to an average of 26.46 general classrooms was found in MS1. A statistically significant increase was noted in the average number of computers located in general classrooms (from 17.19 to 18.98) in MS2. Schools reported an average of 113.87 computers in computer rooms [including Multimedia Learning Centre (MMLC), IT Learning Centre (ITLC) and Computer Laboratory (CL)] per school in MS1. There was a statistically significant increase (from 20.96 to 22.94) in the average number of digital projectors (including LCD projectors) installed in 26.46 general classrooms in MS2.

Table 7.83 Quantity of IT facilities and services in school ([S3]ITEdInfoQ3a.i-ii, 4a-g)

IT facilities	MS1		MS2		*P*-value
	Mean	SD	Mean	SD	
i. Computers:					
Desktop Computer	198.16	70.00	209.46	70.99	0.011*
Notebook	72.25	36.51	64.32	37.49	0.001**
Sum of Computers (Desktop Computer and Notebook)	273.15	98.34	274.39	91.27	0.494
Computers (including desktop and notebook) located in general classrooms	17.19	13.15	18.98	13.64	0.061**
Number of general classrooms	26.46	7.23	26.97	6.53	0.380
Computers (including desktop and notebook) located in computer rooms [including Multimedia Learning Center (MMLC), IT Learning Center (ITLC) and Computer Laboratory (CL)]	113.87	47.73	108.19	47.19	0.088
Number of Computer rooms [including Multimedia Learning Center (MMLC), IT Learning Center (ITLC) and Computer Laboratory (CL)]	3.84	4.64	3.89	8.47	0.370
Student to computer gross ratio	3.91	1.28	3.88	1.29	0.735
Student to computer net ratio (excluding computers in the staff rooms and general office)	4.63	1.63	4.58	1.67	0.606
Teacher to computer ratio (computers in staff room)	5.21	5.99	5.43	7.29	0.639
ii. System/Peripheral facilities:					
Wireless LAN	2.66	5.16	3.19	6.62	0.239
Percentage with at least 1 Wireless LAN	71%		77%		
Video Broadcasting System	0.46	0.64	0.78	2.86	0.047*
Electronic Whiteboard for mobile use	0.35	1.74	0.38	2.10	0.297
Sum of Electronic Whiteboard located in different rooms	0.34		0.54		0.046*
Digital Projectors (including LCD Projector) for mobile use	2.94	3.02	3.03	2.87	0.000***
Digital Projectors located in general classrooms	20.96	10.49	22.94	9.94	0.014*
Sum of Digital Projectors (including LCD Projector) located in different rooms	33.76		36.00		0.021*
Sum of rooms	46.62		47.27		0.565

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

On average, there was 273.15 (SD: 98.34) computers per school in total (including desktop and notebook) for students and teachers in MS1. No statistically significant difference was observed in the total number of computers in secondary schools in MS2 (Table 7.83, [S3]ITEdInfoQ3a.i_1,2). Table 7.84 ([S3]ITEdInfoQ3a.i_1,2) shows the distribution of schools with respect to total number of computers. 92% of schools had more than 160 computers. 29% and 39% of schools reported having computers in the ranges of 161 to 240 and 241 to 320 respectively in MS1.

Table 7.84 Distribution of secondary schools with respect to total number of computers ([S3]ITEdInfoQ3a.i_1,2)

Total number of computers in school	Percentage (%)	
	MS1 (N=384) #	MS2 (N=349) #
> = 401	5	5
321 - 400	19	19
241 - 320	39	39
161 - 240	29	31
82 - 160	7	5
= < 81	1	0
Total	100	100

Number of schools refers to valid cases related to corresponding computing.

The student-computer ratio and teacher-computer ratio are the indicators to evaluate the adequacy of computers for specific user groups: teachers and students. In MS1, the student-to-computer net ratio (excluding computers in staff rooms and general office) for MS1 was 4.63:1 (SD:1.63). When taking into account of all computers in school, including those in staff rooms, offices, etc, the gross ratio for MS1 was 3.91:1 (SD:1.28). No statistically significant difference was noted in these ratios in MS2 (Table 6.83). Table 7.85 ([S3]ITEdInfoQ1b,3a.i_1,2,4e_2,f_2) shows the distribution of student-to-computer ratio across secondary schools. About two-thirds of secondary schools (62%), the student-to-computer gross ratio fell within the range of four to less than eight students (4-<8) to one in MS1. 37% of schools had the ratio better than four students (<4) to one and only 1% of schools with 8 to less than 12 students (8-<12) to one.

Table 7.85 Distribution of the secondary schools with respect to student-computer ratios ([S3]ITEdInfoQ1b,3a.i_1,2, 4e_2,f_2)

Student-computer ratio	Percentage (%)			
	Gross		Net	
	MS1 (N=382) #	MS2 (N=349) #	MS1 (N=382) #	MS2 (N=348) #
> = 20	0	0	0	0
16 - < 20	0	0	0	0
12 - <16	0	0	0	1
8 - <12	1	1	5	4
4 - <8	62	42	74	59
< 4	37	57	22	37
Total	100	100	100	100

Number of schools refers to valid cases related to corresponding computing.

The average teacher-to-computer (computers in staff rooms) ratio was 5.21:1 (SD:5.99) in MS1. No statistically significant difference was noted in MS2 (Table 7.83). Table 7.86 ([S3]ITEdInfoQ1c,4e_2) shows the distribution of teacher-to-computer ratio across secondary schools. In MS1, 27% of secondary schools had a teacher-to-computer ratio falling within the range of four to less than eight teachers (4-<8) to one. 53% of schools had a ratio of less than four (<4) to one and only 4% had a ratio of 20 or more teachers (>=20) to one in staff rooms.

Table 7.86 Distribution of schools with respect to teacher-computer ratios ([S3]ITEdInfoQ1c,4e_2)

Teacher-computer ratio	Percentage (%)	
	MS1 (N=380) #	MS2 (N=342) #
>= 28	2	2
24 - <28	0	1
20 - <24	2	1
16 - <20	2	2
12 - <16	4	4
8 - <12	10	11
4 - <8	27	25
< 4	53	54
Total	100	100

Number of schools refers to valid cases related to corresponding computing.
143 (37%) and 144 (42%) secondary schools had 1:1 teacher-computer ratio in MS1 and MS2 respectively.

Teachers perceived a higher level of sufficiency than students on school IT facilities to meet students' needs — a statistically significant increase was noted in students' perceived level of sufficiency in MS2

The adequacy of IT facilities in schools is further examined from user's perspective. It was found that the proportion of teachers expressing the sufficiency of school IT facilities to meet students' learning need was much higher than that of students in MS1. 33% to 41% of the students (33% of S2, 33% of S4 and 41% of S6) considered the IT facilities in schools as sufficient or very sufficient to meet their learning needs, while 23% to 24% of the students (24% of S2, 24% of S4 and 23% of S6) considered that they were insufficient or totally insufficient. The mean ratings of this item were 3.07 (SD:1.00), 3.08 (SD:0.96) and 3.21 (SD:0.98) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 7.87, [S6]SQ7a). A statistically significant increase was observed in students' perceived sufficiency level of the IT facilities in schools to meet students' needs (MS1: 33%-41%; MS2: 40%-48%) in MS2.

Teachers were also asked to corroborate their views on the adequacy of school IT facilities to meet students' needs in MS1. Around half of them (49%) reported the IT facilities in schools as sufficient or very sufficient to meet students' needs, with a mean rating of 3.39 (SD:0.83) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was found in teachers' perceived level of this aspect in MS2 (Table 7.87, [S5]TQ7a).

Teachers tended to perceive the IT facilities in schools as sufficient to meet their teaching needs

With respect to teachers' needs, nearly half of the secondary school teachers (46%) perceived the IT facilities in schools as sufficient or very sufficient to meet their needs in MS1 with a mean rating of 3.28 (SD:0.91) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted in MS2 (Table 7.87, [S5]TQ7b).

Table 7.87 Teachers' and students' perception of the sufficiency of IT facilities in schools to meet students' and teachers' needs ([S5]TQ7a,b, [S6]SQ7a)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
Levels of sufficiency of the IT facilities in schools to meet students' need															
S2	MS1	3.07	1.00	2276	140	(6)	624	(27)	959	(42)	365	(16)	187	(8)	0.000***
	MS2	3.36	0.96	1859	169	(9)	705	(38)	712	(38)	173	(9)	99	(5)	
S4	MS1	3.08	0.96	2171	124	(6)	593	(27)	923	(42)	400	(18)	131	(6)	0.000***
	MS2	3.21	0.97	1802	111	(6)	613	(34)	745	(41)	206	(11)	126	(7)	
S6	MS1	3.21	0.98	1720	133	(8)	560	(33)	638	(37)	305	(18)	83	(5)	0.000***
	MS2	3.35	0.94	1431	102	(7)	586	(41)	533	(37)	131	(9)	78	(5)	
Teachers	MS1	3.39	0.83	2727	145	(5)	1191	(44)	1035	(38)	304	(11)	52	(2)	0.439
	MS2	3.37	0.84	2048	103	(5)	874	(43)	807	(39)	209	(10)	55	(3)	
Levels of sufficiency of the IT facilities in schools meet teachers' need															
Teachers	MS1	3.28	0.91	2727	135	(5)	1124	(41)	950	(35)	419	(15)	99	(4)	0.977
	MS2	3.28	0.97	2047	138	(7)	808	(39)	692	(34)	300	(15)	109	(5)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.5.1.2 Connectivity and Internet/Intranet Services

All schools had broadband Internet connection — a statistically significant increase was noted in the percentage of schools having a connection speed of 10Mbps or higher in MS2

Connectivity to the Internet is another aspect that has prominent effect on learning and teaching with IT. All secondary schools reported having broadband Internet connection in MS1 and MS2. As for the connection speed, a statistically significant increase was identified in the percentage of schools having a connection speed of 10Mbps or higher (from 75% to 84%) in MS2 (Table 7.88, [S3]ITEdInfoQ5a,b).

92% and 75% of schools in MS1 respectively provided intranets and e-learning platforms — a statistically significant increase was noted in the percentage of schools providing e-learning platforms in MS2

With regard to the Internet service provided by schools, Table 7.88 ([S3]ITEdInfoQ6a-c) shows the percentage of schools with school websites, teachers' or students' homepages, e-learning platforms, intranets and email accounts for teachers, students and parents. In MS1, over 90% of schools had school websites (99%) and school intranets (92%). 75% of schools had e-learning platforms. 66% and 51% had homepages for teachers and students respectively. A statistically significant increase was noted in the percentage of schools with e-learning platforms (from 75% to 83%) in MS2.

Table 7.88 Percentage of schools with Internet connection, school homepages/teachers' homepages/students' homepages/e-learning platforms and intranet ([S3]ITEdInfoQ5a,b,6a)

	IT facilities	MS1 (N=388)	MS2 (N=352)	*P*-value
i.	**Internet Connection**			
	Broadband	100	100	1.000
	Speed of connection: 10Mbps or higher	75	84	0.000***
ii.	**Intranet/internet Services**			
	School homepage	99	100	0.099
	E-learning platform	75	83	0.006 **
	School Intranet	92	95	0.149
	Teachers' homepage	66	60	0.104
	Students' homepage	51	48	0.370

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers perceived a higher level of satisfaction than students with the speed of Internet connection in schools

The speed of Internet connection in schools is further examined from the users' perspective. In MS1, teachers perceived a higher level of satisfaction with the speed of the Internet connection in school than that of the students. Around 30% of the students (28% of S2, 29% of S4 and 34% of S6) were satisfied or very satisfied with the speed of Internet connection in schools, while 36% of S2, 35% of S4 and 30% of S6 students were not satisfied or totally not satisfied with it. The mean ratings of this item for S2, S4 and S6 students were 2.86 (SD:1.12), 2.89 (SD:1.10) and 3.04 (SD:1.07) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 7.89, [S6]SQ7c). As for the teachers, slightly over half of them (53%) were satisfied or very satisfied with the speed of Internet connection in schools while only 12% of them were not satisfied or totally not satisfied with it, with a mean rating of 3.45 (SD:0.82) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 7.89, [S5]TQ7e). A statistically significant increase was found in S2 students' perceived level of satisfaction in this aspect (from 28% to 34%) in MS2. As for teachers and other students, no statistically significant difference was identified in MS2.

Table 7.89 Teachers' and students' perception of the levels of satisfaction with the speed of Internet connection in schools ([S5]TQ7e, [S6]SQ7c)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
S2	MS1	2.86	1.12	2276	162	(7)	486	(21)	819	(36)	493	(22)	315	(14)	0.000***
	MS2	3.04	1.08	1860	134	(7)	504	(27)	733	(39)	275	(15)	215	(12)	
S4	MS1	2.89	1.10	2174	157	(7)	477	(22)	785	(36)	483	(22)	272	(13)	0.928
	MS2	2.87	1.07	1799	92	(5)	411	(23)	710	(39)	337	(19)	248	(14)	
S6	MS1	3.04	1.07	1726	144	(8)	449	(26)	616	(36)	372	(22)	145	(8)	0.289
	MS2	3.00	1.02	1431	67	(5)	408	(29)	556	(39)	261	(18)	139	(10)	
Teachers	MS1	3.45	0.82	2727	164	(6)	1283	(47)	958	(35)	273	(10)	49	(2)	0.085
	MS2	3.49	0.84	2046	153	(7)	971	(47)	700	(34)	174	(9)	48	(2)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.5.1.3 Computer Consumables

Teachers perceived a higher level of sufficiency than students on the consumables in schools — students' perceived sufficiency level of the consumables in schools significantly increased statistically in MS2

Schools should provide sufficient consumables such as paper and toner for printers to support learning and teaching. In MS1, about 30% of the students (31% of S2, 28% of S4 and 29% of S6) expressed that consumables were sufficient or very sufficient, while around 30% of them (27% of S2, 29% of S4 and 35% of S6) considered consumables in schools as insufficient or totally insufficient. The mean ratings of this item for S2, S4 and S6 students were 3.02 (SD:0.98), 2.97 (SD:0.99) and 2.91 (SD:1.05) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 7.90, [S6]SQ7d). Slightly over half of the teachers (56%) considered computer consumables as sufficient or very sufficient while 14% of them regarded the consumables as insufficient or totally insufficient, with a mean rating of 3.47 (SD:0.90) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 7.90, [S5]TQ7f). Secondary school students perceived a lower level of adequacy of computer consumables in schools than that of the teachers. A statistically significant increase was observed in secondary students' perceived sufficiency level of consumables in schools (MS1: 28%-31%; MS2: 34%-40%) in MS2. No statistically significant difference was identified on the teachers' side in MS2.

Table 7.90 Teachers' and students' perception of the sufficiency of consumables (e.g. paper and toner for printers) in schools ([S5]TQ7f, [S6]SQ7d)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
S2	MS1	3.02	0.98	2277	118	(5)	588	(26)	968	(43)	423	(19)	180	(8)	0.000***
	MS2	3.21	0.96	1855	114	(6)	640	(34)	727	(39)	266	(14)	109	(6)	
S4	MS1	2.97	0.99	2173	122	(6)	485	(22)	936	(43)	457	(21)	173	(8)	0.000***
	MS2	3.06	1.01	1794	102	(6)	503	(28)	747	(42)	284	(16)	159	(9)	
S6	MS1	2.91	1.05	1719	107	(6)	403	(23)	602	(35)	451	(26)	156	(9)	0.002**
	MS2	3.02	1.04	1428	92	(6)	376	(26)	553	(39)	279	(20)	128	(9)	
Teachers	MS1	3.47	0.90	2727	215	(8)	1318	(48)	809	(30)	303	(11)	82	(3)	0.107
	MS2	3.52	0.88	2046	187	(9)	996	(49)	597	(29)	220	(11)	46	(2)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.5.1.4 Provision of Computer Facilities beyond School Hours

School heads were satisfied with the provision of sufficient IT facilities for students beyond school hours

The provision of computer facilities beyond school hours is also important to support students' learning with the use of IT. As reported in Section 7.7.3, nearly all secondary schools (98%) had opened computer rooms for students after school in MS1 (Table 7.127, [S2]HQ10a). 86% of school heads were satisfied or very satisfied with the provision of sufficient IT facilities for students beyond school hours. No statistically significant difference was found in MS2 (Table 6.91, ([S1]HSQ6g).

Table 7.91 School heads' levels of satisfaction with the provision of sufficient IT facilities for students beyond school hours ([S1]HSQ6g)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school provides sufficient IT facilities for students beyond school hours."									
MS1	4.10	0.67	397	102 (26)	239 (60)	49 (12)	6 (2)	1 (0)	0.865
MS2	4.12	0.56	354	80 (23)	239 (68)	34 (10)	1 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students considered the opening hours of computer rooms beyond school hours as quite sufficient (一般)

When students were asked about the sufficiency of opening hours of computer facilities after school, 29% of S2, 30% of S4 and 30% of S6 students considered the opening hours to be sufficient or very sufficient, while 30% of S2, 29% of S4 and 30% of S6 students considered it as insufficient or totally insufficient in MS1. The mean ratings of this item were 2.97 (SD:1.01), 2.99 (SD:0.99) and 3.00 (SD:0.99) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 7.92, [S6]SQ7e). There was a statistically significant increase in S2 students' (from 29% to 37%) perceived level of the sufficiency with regard to the opening hours of computer rooms beyond school hours in MS2.

Table 7.92 Students' perception of the levels of sufficiency with regard to the opening hours of computer rooms beyond school hours ([S6]SQ7e)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option					P-value
					Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient	
S2	MS1	2.97	1.01	2182	130 (6)	502 (23)	900 (41)	460 (21)	189 (9)	0.000***
	MS2	3.09	1.04	1748	118 (7)	517 (30)	664 (38)	298 (17)	150 (9)	
S4	MS1	2.99	0.99	2087	118 (6)	505 (24)	863 (41)	438 (21)	162 (8)	0.373
	MS2	3.00	1.02	1696	86 (5)	461 (27)	678 (40)	312 (18)	160 (9)	
S6	MS1	3.00	0.99	1637	100 (6)	396 (24)	652 (40)	378 (23)	111 (7)	0.070
	MS2	3.02	0.95	1332	38 (3)	404 (30)	542 (41)	247 (19)	101 (8)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.5.2 Management and Maintenance of IT Facilities and Technical Support Services

School heads were satisfied with the quality IT management, maintenance and technical support services provided by their schools for students and teachers

While a well-established infrastructure and sufficient IT facilities in schools are important to the successful implementation of ITEd, other factors such as effective management and maintenance of IT facilities and efficient technical support services are also crucial. In MS1, 86% of school heads

were satisfied or very satisfied with the quality IT management, maintenance and technical support services provided by their schools for students and teachers. No statistically significant difference was found in MS2 (Table 7.93, ([S1]HSQ6e).

Table 7.93 School heads' levels of satisfaction with IT management, maintenance and technical support services ([S1]HSQ6e)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school provides quality IT management, maintenance and technical support services for students and teachers"									
MS1	4.04	0.64	397	79 (20)	261 (66)	52 (13)	3 (1)	2 (1)	0.818
MS2	4.06	0.58	354	68 (19)	241 (68)	43 (12)	2 (1)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived that it was quite easy (一般) to get support when encountering technical problems in using computers

When looking into the easiness of getting technical support (Table 7.94, [S6]SQ9a), more than 30% of the students (36% of S2, 33% of S4 and 31% of S6) in MS1 considered that it was easy or very easy to get such support when they encountered technical problems, with mean ratings of 3.18 (SD:1.02), 3.15 (SD:0.99) and 3.09 (SD:0.99) respectively on a scale of 1 to 5 where 1 was 'not easy at all' and 5 was 'very easy'. A statistically significant increase was noted in students' perceived level of easiness in getting support when encountering technical problems in using the computers (MS1: 31%-36%; MS2: 37%-42%) in MS2.

Table 7.94 Students' perception of the levels of easiness in getting support when encountering technical problems in using the computers ([S6]SQ9a)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option					P-value
					Very easy	Easy	Quite easy (一般)	Not easy	Not easy at all	
S2	MS1	3.18	1.02	2272	242 (11)	564 (25)	977 (43)	346 (15)	144 (6)	0.000***
	MS2	3.33	1.00	1853	264 (14)	478 (26)	793 (43)	245 (13)	73 (4)	
S4	MS1	3.15	0.99	2174	213 (10)	496 (23)	977 (45)	369 (17)	119 (5)	0.000***
	MS2	3.38	1.01	1793	270 (15)	490 (27)	756 (42)	199 (11)	78 (4)	
S6	MS1	3.09	0.99	1725	153 (9)	375 (22)	768 (45)	335 (19)	94 (5)	0.000***
	MS2	3.25	0.99	1430	159 (11)	375 (26)	619 (43)	210 (15)	65 (5)	

Mean: 1="Not easy at all" and 5="Very easy"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers considered the technical support provided by IT technicians in schools as the most satisfactory channel

With regard to the channels from which the teachers could seek technical support, it was found in MS1 that 30% to 44% of the teachers indicated that they did not seek the technical support from "other technical support service provider" (44%), the EMB (39%), the "HKEdCity" (38%), "school-based technical support service provider" (37%) as well as "friends and relatives" (30%). 70% of the respondents considered the support from "IT technicians in school" as satisfied or very satisfied, followed by "ITEd team members in school" (64%), "other colleagues in school" (58%) and "friends and relatives" (53%). Less than 40% of the teachers were satisfied or very satisfied with the support from the "school-based technical support service provider" (37%), "other technical support service provider" (31%) and the "HKEdCity" (30%). Other support channels from the EMB such as Centres of Excellence (CoEs) and ITEd Support Service Centre (ITeHelp) were considered as satisfied or very satisfied by 19% of the surveyed teachers, with a mean rating of 3.01 (SD:0.71) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. A statistically significant increase was noted in teachers' perceived level of satisfaction with the technical support from the EMB (from 19% to 23%) in MS2, but a statistically significant decrease was observed in the perceived level of satisfaction with the support from friends and relatives (from 53% to 49%) in MS2 (Table 7.95, [S5]TQ9b.i-ix).

Table 7.95 Teachers' levels of satisfaction with the technical support from different channels when encountering technical problems in using the computers ([S5]TQ9b.i-ix)

Channels of technical support	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					No related technical support channels (不曾要求有關支援)	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					No related technical support channels (不曾要求有關支援)	
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied					Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied		
i. ITEd team members in school	3.67	0.75	2645	259 (10)	1430 (54)	824 (31)	99 (4)	33 (1)	82 (3)	3.67	0.78	1975	216 (11)	1031 (52)	616 (31)	86 (4)	26 (1)	69 (3)	0.830
ii. IT technician(s) in school	3.77	0.72	2683	324 (12)	1543 (58)	717 (27)	81 (3)	18 (1)	44 (2)	3.75	0.78	2017	258 (13)	1121 (56)	532 (26)	80 (4)	26 (1)	27 (1)	0.709
iii. Other Colleagues in school	3.62	0.66	2577	174 (7)	1326 (51)	1005 (39)	63 (2)	9 (0)	149 (5)	3.61	0.68	1932	135 (7)	968 (50)	768 (40)	53 (3)	8 (0)	111 (5)	0.512
iv. School-based technical support service provider	3.29	0.70	1714	45 (3)	589 (34)	929 (54)	125 (7)	26 (2)	1013 (37)	3.31	0.75	1276	57 (4)	422 (33)	674 (53)	103 (8)	20 (2)	765 (37)	0.410
v. Other technical support service provider	3.22	0.66	1519	25 (2)	445 (29)	910 (60)	120 (8)	19 (1)	1208 (44)	3.25	0.74	1146	53 (5)	313 (27)	666 (58)	93 (8)	21 (2)	894 (44)	0.240
vi. Education and Manpower Bureau [e.g. Centres of Excellence(CoEs) , ITEd Support Service Center (ITeHelp)*]	3.01	0.71	1260	13 (1)	233 (18)	811 (64)	155 (12)	48 (4)	811 (39)	3.08	0.76	969	34 (4)	183 (19)	605 (62)	116 (12)	31 (3)	1070 (52)	0.017*
vii. HKEdCity	3.21	0.66	1559	28 (2)	434 (28)	970 (62)	99 (6)	28 (2)	970 (38)	3.21	0.73	1151	40 (3)	300 (26)	695 (60)	88 (8)	28 (2)	889 (43)	0.933
viii. Friends and relatives	3.57	0.73	2120	187 (9)	943 (44)	898 (42)	76 (4)	16 (1)	898 (30)	3.51	0.74	1556	122 (8)	640 (41)	712 (46)	70 (4)	12 (1)	483 (24)	0.008**
ix. Others (Please specify)	3.39	0.97	72	9 (13)	23 (32)	30 (42)	7 (10)	3 (4)	30 (29)	3.18	1.07	71	6 (8)	21 (30)	33 (46)	2 (3)	9 (13)	105 (5)	0.349

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *$p<0.05$; **$p<0.01$; ***$p<0.001$.
N=Valid count (N) (excluding no. of teachers choosing 'No related technical support channels')
*Information Technology in Education Support Centre Service

7.5.3 Upgrading IT Facilities and Exploring Advanced IT Technology

School heads were satisfied that their schools continually upgraded IT facilities and explored advanced IT technology for learning and teaching

Upgrading IT facilities and exploring advanced information technologies for enhancing learning and teaching are other key aspects for successful implementation of ITEd. . In MS1, 90% of school heads were satisfied or very satisfied that their schools continually improved the IT infrastructure and renewed equipment to effectively support the present day learning and teaching needs. 79% of them were satisfied or very satisfied that their schools continually improved IT infrastructure with advanced technology to enhance the effectiveness in learning, teaching, assessment and school administration. No statistically significant difference was observed in school heads' levels of satisfaction with both areas in MS2 (Table 7.96, [S1]HSQ6h,i).

Table 7.96 School heads' levels of satisfaction with the improvement of IT infrastructure ([S1]HSQ6h,i)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school continually improves the IT infrastructure and renews equipment to effectively support the present day learning and teaching needs."									
MS1	4.19	0.62	397	118 (30)	239 (60)	37 (9)	3 (1)	0 (0)	0.910
MS2	4.18	0.63	354	104 (29)	214 (60)	32 (9)	4 (1)	0 (0)	
"The school continually improves IT infrastructure with advanced technology to enhance the effectiveness in learning, teaching, assessment and school administration."									
MS1	3.93	0.65	397	62 (16)	251 (63)	77 (19)	7 (2)	0 (0)	0.875
MS2	3.93	0.64	354	59 (17)	213 (60)	80 (23)	2 (1)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students and teachers perceived school IT infrastructure as quite sufficient (一般) to meet their needs – a statistically significant increase was noted in students' perceived level of the sufficiency of IT infrastructure in MS2

In MS1, around two-fifths of the teachers (43%) considered the IT infrastructure such as upgraded computer model and computer operating system in their schools as sufficient or very sufficient to meet their teaching needs whereas 19% of them considered them as insufficient or totally insufficient, with a mean rating of 3.24 (SD:0.88) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 7.97, [S5]TQ7c). No statistically significant difference was identified in teachers' perceived sufficiency level of the IT infrastructure to meet their teaching needs in MS2.

As for the students, 35% of S2, 31% of S4 and 37% of S6 students in MS1 considered the IT infrastructure in schools as sufficient or very sufficient in meeting their learning needs, with mean ratings of 3.07 (SD:1.05), 3.05 (SD:0.98) and 3.16 (SD:0.97) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'(Table 7.97, [S6]SQ7b). A statistically significant increase was noted in students' perceived sufficiency level of the IT infrastructure to meet their learning needs (MS1: 31%-37%; MS2: 37%-45%) in MS2.

Teachers perceived the advanced IT facilities as quite sufficient (一般) to promote innovative teaching pedagogy

When teachers were asked about the sufficiency of advanced IT facilities such as wireless network system in promoting innovative teaching pedagogy, less than 40% of the respondents in MS1 (38%) considered them as sufficient or very sufficient, with a mean rating of 3.21 (SD:0.80) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 7.97, [S5]TQ7d). No

statistically significant difference was noted in MS2.

Table 7.97 Teachers' and students' perception of the sufficiency of IT infrastructure meet their needs and the IT facilities in schools to promote innovative teaching pedagogy ([S5]TQ7c,d, [S6]SQ7b)

Class levels/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
Levels of sufficiency of IT infrastructure (e.g. upgraded computer model and computer operating system) meet students' learning/teachers' teaching needs															
S2	MS1	3.07	1.05	2273	165	(7)	635	(28)	868	(38)	406	(18)	201	(9)	0.000***
	MS2	3.34	0.95	1856	163	(9)	672	(36)	742	(40)	187	(10)	93	(5)	
S4	MS1	3.05	0.98	2172	130	(6)	553	(25)	927	(43)	411	(19)	152	(7)	0.000***
	MS2	3.17	0.96	1801	107	(6)	558	(31)	786	(44)	230	(13)	120	(7)	
S6	MS1	3.16	0.97	1725	137	(8)	494	(29)	687	(40)	329	(19)	78	(5)	0.002**
	MS2	3.20	0.93	1428	60	(4)	526	(37)	573	(40)	180	(13)	90	(6)	
Teachers	MS1	3.24	0.88	2727	98	(4)	1070	(39)	1048	(38)	411	(15)	100	(4)	0.170
	MS2	3.26	0.92	2047	96	(5)	832	(41)	734	(36)	288	(14)	97	(5)	
Levels of sufficiency of IT facilities (e.g. wireless network system) in schools to promote innovative teaching pedagogy															
Teachers	MS1	3.21	0.80	2727	62	(2)	971	(36)	1244	(46)	381	(14)	69	(3)	0.071
	MS2	3.25	0.84	2046	74	(4)	761	(37)	872	(43)	285	(14)	54	(3)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in secondary schools as indicated by school heads were: computers and projectors in classrooms, e-learning platforms and multi-media computer rooms

School heads were also asked to indicate the three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in schools. The three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in schools as reported by school heads were: "e-learning platform" (58%), "computers and projectors in classroom" (58%) and "multi-media computer rooms" (45%). They were followed by "mobile learning devices" (30%), "wireless network" (27%) and "school campus digital TV" (22%). The two least needed IT facilities or services were "video conferencing devices" (9%) and "e-mail" (3%). There was a statistically significant increase in the need of "interactive electronic whiteboard" (from 14% to 20%) in MS2 (Table 7.98, [S2]HQ7).

The three most needed additional IT facilities or services which should be prioritized for teachers' and students' use as indicated by school heads were: e-learning platforms, mobile learning devices as well as computers and projectors in classrooms — the need for interactive electronic whiteboard significantly increased statistically while the need for wireless network significantly decreased statistically in MS2

In MS1, school heads indicated that the top three priorities for additional IT facilities or services that most needed for students and teachers were "e-learning platform" (50%), "mobile learning devices" (44%) and "computers and projectors in classroom" (42%) (Table 7.65, [S2]HQ8). Other options selected by a reasonable number of school heads were "school campus digital TV" (36%) and "wireless network" (32%). A statistically significant increase was noted in the percentage of school heads choosing the priority of "interactive electronic whiteboard" (from 28% to 39%) for additional IT facilities or services which were needed for students and teachers in MS2. However, there was a statistically significant decrease in the priority of "wireless network" (from 32% to 26%) in MS2.

Table 7.98 Facilities/services which were mostly needed and should be upgraded to provide an environment conducive to ITEd in schools ([S2]HQ7) and additional facilities/services which schools wished to be prioritized for teachers' and students' use ([S2]HQ8).

IT facilities/services	**Percentage (%)**					
	Mostly needed upgraded facilities/services			**Prioritized additional facilities/services**		
	MS1 (N=362)	**MS2 (N=351)**	***P*-value**	**MS1 (N=377)**	**MS2 (N=348)**	***P*-value**
Computers and projectors in classroom	58	60	0.676	42	42	0.933
E-learning platform[#]	58	54	0.297	50	44	0.129
Multi-media computer rooms	45	43	0.540	23	22	0.766
Mobile learning devices (e.g. Personal Digital Assistant (PDA), Pocket Personal Computer (PC))	30	30	0.979	44	48	0.252
Wireless network	27	25	0.386	32	26	0.031*
School campus digital TV	22	23	0.756	36	35	0.838
Digital tools (e.g. digital cameras)	18	15	0.216	19	16	0.387
Broadband internet connection	15	17	0.428	5	4	0.896
Interactive electronic whiteboard	14	20	0.023*	28	39	0.001**
Video conferencing devices	9	9	0.895	19	19	0.814
E-mail	3	3	0.462	2	3	0.348
Others (Please specify):	1	1	0.451	1	2	0.125

Three option selections; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

7.6 Providing Continuous Research and Development

The sixth strategic goal of the Second ITEd Strategy is "Providing continuous research and development". This strategy aims at doing research on the effectiveness of the ITEd strategy and the impact of IT on students' learning outcome as well as pioneering leading edge IT applications in pedagogy, education resources, school practices, curriculum integration and systems development.

School heads tended to be satisfied with their schools actively taking part in pilot projects or schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching

Table 7.99 ([S1]HSQ8a-c) shows that 27% to 40% of school heads were satisfied or very satisfied with the three listed outcomes regarding the continuous research and development in ITEd in MS1. 40% of school heads were satisfied or very satisfied that their schools actively took part in pilot projects or pilot schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching. 34% of them were satisfied or very satisfied that their schools actively studied or evaluated the effectiveness of some innovative IT pedagogical strategies and shared the experience with the education community. Regarding the research-based projects, 27% of school heads were satisfied or very satisfied that the EMB could share the results of these projects with schools in order to assist them in the promotion of ITEd. All mean values fell in the range of 3.09 to 3.30 (SD:0.72-0.78) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference in all of the above three listed outcomes was noted in MS2.

Around one-third of the secondary schools had launched pilot schemes or projects on the use of IT for teaching

The EMB has encouraged innovative use of IT in education and has initiated some pilot schemes in secondary schools in collaboration with organisations or institutions in the community. The extent of participation of schools in such ITEd innovation projects revealed the level of achievement in this aspect. In MS1, 31% of schools had launched pilot schemes or projects on the use of IT for teaching in the school year of 2004/05. 54% of them had launched similar pilot schemes or projects with other organisations. Of these, 35% of schools collaborated with local tertiary institutions, 33% with local community or commercial organisations and 32% with the EMB. No statistically significant difference was noted for the above items in MS2 (Table 7.100, [S2]HQ16a-c).

Table 7.99 School heads' levels of satisfaction with continuous research and development in ITEd ([S1]HSQ8a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied	
a.	3.30	0.76	397	18	(5)	137	(35)	191	(48)	50 (13)	1 (0)	3.38	0.79	354	25	(7)	127	(36)	162	(46)	39 (11)	1 (0)	0.187
b.	3.23	0.78	397	20	(5)	115	(29)	202	(51)	57 (14)	3 (1)	3.21	0.80	354	22	(6)	91	(26)	182	(51)	58 (16)	1 (0)	0.569
c.	3.09	0.72	397	5	(1)	102	(26)	218	(55)	67 (17)	5 (1)	3.15	0.74	354	11	(3)	90	(25)	201	(57)	46 (13)	6 (2)	0.272

Aspects related to continuous research and development in ITEd

a. The school actively takes part in pilot projects or pilot schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching.

b. The school actively studies or evaluates the effectiveness of some innovative IT pedagogical strategies and to share the experience with the education community.

c. The Education and Manpower Bureau can share the results of research-based projects (e.g. electronic school bag and interactive white board) with schools to assist schools in the promotion of ITEd.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.100 School heads' reported on the pilot schemes on the use of IT for teaching in their schools in the 2004/05 and 2005/06 school years ([S2]HQ16a-c)

Pilot schemes	**Percentage (%)**		***P*-value**
	MS1 (N=372)	**MS2 (N=339)**	
YES	31	26	0.196
NO	69	74	
Collaboration with other organisations	**(N=114)**	**(N=89)**	
YES	54	47	0.310
NO	46	53	
Organisations	**(N=62)**	**(N=42)**	
Local tertiary institutions	35	43	0.450
Local community/commercial organisations	33	33	0.955
Education and Manpower Bureau	32	48	0.116
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	30	19	0.188
Local primary, secondary, and special schools	24	21	0.744
Oversea schools/community organisations/commercial organisations/tertiary institutions	11	7	0.484

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers expressed a neutral(一般) attitude towards the usefulness of the EMB support or resources, such as sharing the results of research-based projects with schools, in developing their ability in using IT for teaching

The EMB provided various support and resources in sharing the results of research-based projects, such as electronic school bag and interactive electronic whiteboard, with schools. In MS1, 15% of the teachers agreed or strongly agreed that the EMB support or resources were useful in developing their ability in using IT for teaching whereas 21% of them disagree or strongly disagreed with this, with a mean rating of 2.92 (SD:0.68) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. No statistically significant difference was noted in MS2 (Table 7.101, [S5]TQ19e).

Table 7.101 Teachers' levels of agreement on the usefulness of the support/resources provided by the Education and Manpower Bureau to develop teachers' ability in using IT ([S5]TQ19e)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Strongly agree	Agree	Neutral (一般)	Disagree	Strongly disagree	
Levels of agreement of the usefulness on the support/resources by Education and Manpower Bureau [e.g. sharing the results of research-based projects (e.g. electronic school bag and interactive electronic whiteboard) with schools] to develop teachers' ability in using IT for teaching									
MS1	2.92	0.68	2704	9 (0)	406 (15)	1719 (64)	490 (18)	80 (3)	0.853
MS2	2.92	0.71	2011	24 (1)	288 (14)	1279 (64)	346 (17)	74 (4)	

Mean: 1= "Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers had some participation in exploring new technology as well as researching and evaluating the effectiveness of ITEd in schools

In MS1, 40% of the ITEd team teachers perceived that they had considerable or strong participation in exploring new technology such as wireless system and developing innovative teaching methods when implementing school ITEd plans whereas 27% of them perceived that they had little participation or no participation at all. The mean rating was 3.12 (SD:1.13) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation' (Table 7.102, [S4]ITQ3i). 33% of them perceived that they had considerable or strong participation in performing research and evaluation on the effectiveness of ITEd in school while 26% of them perceived that they had little participation or no participation in doing so, with a mean rating of 3.03 (SD:1.02) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation'. No statistically significant difference was identified in these two areas in MS2 (Table 7.102, [S4]ITQ3j).

Table 7.102 ITEd Team teachers' perception of their participation in different tasks when implementing school ITEd plan ([S4]ITQ3i,j)

	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option					*P*-value
				Strong participation	Considerable participation	Some participation (一般)	Little participation	None	
"To explore new technology (e.g. wireless network system) and develop innovative teaching methods."									
MS1	3.12	1.13	339	33 (10)	102 (30)	112 (33)	55 (16)	37 (11)	0.075
MS2	3.31	1.03	229	29 (13)	67 (29)	92 (40)	28 (12)	13 (6)	
"To research and evaluate on the effectiveness of ITEd in school"									
MS1	3.03	1.02	339	15 (4)	100 (29)	137 (40)	53 (16)	34 (10)	0.127
MS2	3.17	1.03	229	20 (9)	68 (30)	90 (39)	34 (15)	17 (7)	

Mean: 1= 1= "None" and 5="Strong participation"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.7 Promoting Community–wide Support and Community Building

The seventh strategic goal of the Second ITEd Strategy is "Promoting community-wide support and community building". This strategy aims to enhance home-school co-operation and community-school collaboration. Two key areas in home-school co-operation were studied. First of all, parents are encouraged to involve in ITEd with regard to motivating their children towards the appropriate use of IT and delivering home messages on cyber ethics. Secondly, schools are encouraged to enhance communication with parents through the use of IT. Community-school collaboration, such as school support from the IT industry, NGOs and community organisations, will contribute to ITEd in terms of trainings and providing digital resources and IT facilities. These collaborations will help to address the digital divide issue and will ultimately help the building of the community.

The sections below examine the following aspects:

- Home-school co-operation and parents' involvement
- Community-wide involvement
- Digital divide

7.7.1 Home-school Co-operation and Parents' Involvement

The extent of schools' initiatives in home-school co-operation, including measures to enhance communication between schools and parents as well as parents' involvement in the promotion of ITEd and their satisfaction with these collaboration activities or programmes, are discussed in this section.

7.7.1.1 Home-school Co-operation

School heads were quite satisfied (一般) with their schools setting up concrete programmes to encourage parents' involvement in ITEd – a statistically significant increase was noted in this aspect in MS2

Regarding the concrete programmes that schools set up to encourage parents' involvement in and promotion of related work on ITEd, 28% of school heads in MS1 were satisfied or very satisfied with this aspect with a statistically significant increase to 37% in MS2 (Table 7.103, [S1]HSQ7a).

Table 7.103 School heads' levels of satisfaction with their schools setting up concrete programmes to encourage parents' involvement in and promotion of related work on ITEd ([S1]HSQ7a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school sets up concrete programme(s) to encourage parents' involvement in and promotion of related work on ITEd."									
MS1	3.12	0.72	397	8 (2)	102 (26)	221 (56)	63 (16)	3 (1)	0.001**
MS2	3.30	0.69	354	11 (3)	119 (34)	191 (54)	31 (9)	2 (1)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common measure in which schools or Parent-Teacher Associations carried out to encourage parents' participation in related work of ITEd in schools was encouraging parents to understand situations in schools through visiting school websites or intranets — a statistically significant increase was found in the percentage of schools providing ITEd activities for parents in MS2

School heads were asked about the attempts that their schools or the Parent-Teacher Associations in schools made in organising home-school collaboration activities. In MS1, the two most common measures were encouraging parents to understand situations in schools through visiting school websites or intranets (87%) and providing ITEd activities for parents (69%). The percentage of schools that had taken the measures to provide ITEd activities for parents significantly increased statistically to 84% in MS2. In MS1, 67% of schools encouraged parents to instill proper principles, values and attitude in the use of IT into their children. This percentage significantly increased statistically to 75% in MS2. Around half of school heads (49%) in MS1 indicated that they explained the work of ITEd in schools to parents (Table 7.104, [S2]HQ13a-d).

Table 7.104 Activities/measures which schools/Parent-Teacher Associations organised/ carried out to encourage parents' participation in related work of ITEd in schools in the 2004/05 and 2005/06 school years ([S2]HQ13a-d)

Measures taken to encourage parents' participation in related work of ITEd in school	Percentage (%)		*P*-value
	MS1 (N=388)	MS2 (N=347)	
a. Encouraged parents to visit the school website/intranet so as to understand the situation in school (e.g. IT in Education)	87	91	0.056
b. Provided ITEd activities for parents	69	84	0.000***
d. Encouraged parents to instill the proper principles, values and attitude in the use of IT into their child/children	67	75	0.028*
c. Explained the work of ITEd in school to parents	49	54	0.177

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common activity participated by parents was basic computer operation course

With regard to the participation of parents in ITEd-related programmes or activities organised by schools in the 2004/05 school year, a low participation rate of 8% was reported in MS1 and the percentage significantly increased statistically to 13% in MS2. (Table 7.105, [S7]PQ17). Of which, the most common activity participated by parents in MS1 was "basic computer operation course" (50%). Less than a quarter of the parents (24%) indicated that they participated in "Internet information course", followed by "talks on teaching children in using IT properly" (18%) and "talks on teaching children in learning IT" (18%) as well as the "Parent-Child IT learning workshop" (14%). A statistically significant decrease was observed in parents' participation in the two following activities: "Internet information course" (from 24% to 18%) and "Parent-Child IT learning workshop" (from 14% to 9%) in MS2 (Table 7.105, [S7]PQ18).

Table 7.105 Parents' participation in ITEd programmes/activities organised by schools in the 2004/05 and 2005/06 school years ([S7]PQ17,18)

Parents' participation in ITEd programme/activity	Percentage (%)		*P*-value
	MS1 (N=5491)	MS2 (N=3988)	
YES	8	13	0.000***
NO	92	87	
Modes of IT in Education programmes/activities	**(N=456)**	**(N=530)**	
Basic computer operation course	50	49	0.993
Internet information course	24	18	0.045*
Talks on teaching children in learning IT	18	17	0.577
Talks on teaching children in using IT properly	18	23	0.180
Parent-Child IT learning workshop	14	9	0.046*
Others	22	28	0.022*

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Parents perceived that ITEd programmes or activities organised by schools for parents were quite sufficient (一般)

When parents were asked about the adequacy of ITEd programmes or activities organised by schools for parents, 24% of them in MS1 considered that they were sufficient or very sufficient while 14% of them considered them as insufficient or totally insufficient, with a mean rating of 3.15 (SD:0.80) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted in MS2 (Table 7.106, [S7]PQ20).

Around two-thirds of the parents agreed or strongly agreed that ITEd programmes or activities could enhance parent-child relationship and their understanding of the ITEd policy in their children's schools

With respect to the effectiveness of ITEd programmes or activities, parents indicated a positive attitude towards the outcomes derived from these activities. In MS1, around 51% to 62% of the parents strongly agreed or agreed that these programmes or activities enhanced their understanding of the ITEd policy in their children's schools (62%), enhanced parent-child relationship (58%) and their IT proficiency (54%) as well as increased their interest in IT (51%). No statistically significant difference was found in MS2 on these aspects (Table 7.106, [S7]PQ21a-d).

Parents were generally willing to participate in ITEd programmes/activities

When parents were asked to show their willingness to participate in ITEd programmes or activities in the future, 26% of them in MS1 indicated that they were willing or very willing to participate in these activities in the future whereas 24% of them indicated that they were not very willing or totally not willing to do so. The mean rating of this item was 3.00 (SD:0.84) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. No statistically significant difference was found in MS2 (Table 7.106, [S7]PQ22).

Table 7.106 Parents' perception of the levels of sufficiency, agreement of the outcomes and willingness to participate in ITEd programmes/activities organised by the schools ([S7]PQ20-22)

	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Parents choosing the option						Mean (1-5)	SD	N	Count (%) of Parents choosing the option						
					Very sufficient	Sufficient		Quite sufficient (一般)	Insufficient	Totally Insufficient				Very sufficient	Sufficient		Quite sufficient (一般)	Insufficient	Totally Insufficient	
Levels of sufficiency of ITEd programmes/activities for parents (Mean: 1="Totally insufficient" and 5="Very sufficient")	3.15	0.80	456	34	(7)	77	(17)	280 (61)	57 (12)	9 (2)	3.21	0.75	530	29	(5)	123	(23)	313 (59)	58 (11)	7 (1)	0.087
Outcomes derived from IT in Education programmes/activities	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Parents choosing the option						Mean (1-5)	SD	N	Count (%) of Parents choosing the option						
					Strongly agree	Agree		Neutral	Disagree	Strongly disagree				Strongly agree	Agree		Neutral	Disagree	Strongly disagree	
a. Enhance your understanding of the ITEd policy in your child's school	3.72	0.70	456	56	(12)	227	(50)	164 (36)	8 (2)	1 (0)	3.65	0.78	530	74	(14)	217	(41)	223 (42)	10 (2)	5 (1)	0.111
b. Increase your interest in IT	3.56	0.72	456	40	(9)	194	(42)	205 (45)	15 (3)	3 (1)	3.52	0.73	530	45	(8)	210	(40)	253 (48)	17 (3)	4 (1)	0.302
c. Enhance your IT proficiency	3.59	0.75	456	49	(11)	195	(43)	192 (42)	17 (4)	3 (1)	3.54	0.73	530	44	(8)	225	(42)	238 (45)	19 (4)	4 (1)	0.215
d. Enhance parent-child relationship	3.63	0.76	456	49	(11)	215	(47)	171 (37)	18 (4)	4 (1)	3.57	0.80	530	55	(10)	233	(44)	205 (39)	31 (6)	6 (1)	0.256
(Mean: 1="Strongly disagree" and 5="Strongly agree")																					
	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Parents choosing the option						Mean (1-5)	SD	N	Count (%) of Parents choosing the option						
					Very willing	Willing		Maybe (一般)	Not very willing (不願意)	Totally not willing				Very willing	Willing		Maybe (一般)	Not very willing (不願意)	Totally not willing	
Levels of willingness to participate in ITEd programmes/activities to be organised in schools (Mean: 1="Totally not willing" and 5="Very willing")	3.00	0.84	5914	149	(3)	1387	(23)	2944 (50)	1192 (20)	243 (4)	2.96	0.83	4331	86	(2)	968	(22)	2147 (50)	935 (22)	195 (5)	0.065

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.7.1.2 Parents' Use of IT as a Communication Tool

The use of e-learning platform as a communication tool amongst parents, teachers and schools was not common

Regarding the use of e-learning platforms as a tool for communication, 30% of the parents in MS1 had heard about the platforms. Among parents who had heard about e-learning platforms, 11% of them frequently or very frequently visited the platforms whereas 60% of them rarely or never visited the platforms. The mean value of this item was 2.30 (SD:1.04) on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 7.107, [S7]PQ9a,b). Regarding the effective use of e-learning platforms by schools for communication purpose among parents, schools and teachers, 34% of the parents agreed or strongly agreed that it was effective, with a mean rating of 3.20 (SD:0.75) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 7.107, [S7]PQ9e). No statistically significant difference was found in the above three aspects listed in Table 7.107.

Table 7.107 Parents' levels of frequency in visiting e-learning platforms and their levels of agreement to schools' effective use of the platforms to promote communication amongst parents, schools and teachers ([S7]PQ9a,b,e)

Whether parents had heard about the e-learning platform provided by the schools	**Percentage (%)**		**_P_-value**
	MS1 (N=5931)	**MS2 (N=4322)**	
YES	30	31	0.138
NO	70	69	

	Mean (1-5)	**SD**	**N**	**Count (%) of Parents choosing the option**										**_P_-value**
				Very Frequently		**Frequently**		**Occasionally (間中)**		**Rarely**		**Never**		
Levels of frequency that parents visited the e-learning platforms (Mean: 1="Never" and 5="Very frequently")														
MS1	2.30	1.04	1766	60	(3)	149	(8)	491	(28)	620	(35)	447	(25)	0.683
MS2	2.27	1.03	1347	47	(3)	96	(7)	381	(28)	472	(35)	352	(26)	

	Mean (1-5)	**SD**	**N**	**Count (%) of Parents choosing the option**										**_P_-value**
				Strongly agree		**Agree**		**Neutral (一般)**		**Disagree**		**Strongly disagree**		
Levels of agreement that the school could effectively use the e-learning platform to promote their communication with the school and teachers (Mean: 1="Strongly disagree" and 5="Strongly agree")														
MS1	3.20	0.75	1766	51	(3)	539	(31)	916	(52)	238	(13)	23	(1)	0.541
MS2	3.18	0.78	1347	48	(4)	385	(29)	706	(52)	180	(13)	28	(2)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Similar to the perception of parents, a small proportion of the teachers showed positive attitude towards the use of e-learning platforms to communicate with parents. Less than a quarter of the teachers (24%) in MS1 expressed that they were willing or very willing to make use of the platforms to communicate with parents while 26% of them indicated that they were not very willing or totally not willing to do so. The mean value of this item was 2.94 (SD:0.83) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing' (Table 7.108, [S5]TQ11e). In MS2, a statistically significant increase was noted in teachers' level of willingness in making use of e-learning platforms to communicate with parents (from 24% to 25%). When looking at the practice of teachers in this regard, almost none of the teachers (2%) in MS1 reported that they frequently or very frequently used e-learning platforms to communicate with parents. 86% of them expressed that they rarely or never used the platforms for this purpose. The mean rating of this item was 1.54 (SD:0.78) on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. In MS2, although there was a statistically significant increase in the percentage of teachers who used e-learning platforms frequently or very frequently to communicate with parents (from 2% to 3%), the platform was still not a common means for teachers to communicate with parents (Table 7.108, [S5]TQ11f).

Table 7.108 Teachers' levels of willingness and frequency in the use of e-learning platforms to communicate with parents [S5]TQ11e,f)

	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	
Levels of willingness of teachers making use of the e-learning platform to communicate with parents (Mean: 1="Totally not willing" and 5="Very willing")									
MS1	2.94	0.83	2657	26 (1)	616 (23)	1323 (50)	558 (21)	134 (5)	0.039*
MS2	2.99	0.82	1955	27 (1)	471 (24)	1006 (51)	361 (18)	90 (5)	
	Mean (1-5)	**SD**	**N**	**Count (%) of Teachers choosing the option**					***P*-value**
				Very Frequently	**Frequently**	**Occasionally (間中)**	**Rarely**	**Never**	
Levels of frequency that teachers used the e-learning platform to communicate with parents (Mean: 1="Never" and 5="Very frequently")									
MS1	1.54	0.78	2657	4 (0)	46 (2)	319 (12)	650 (24)	1638 (62)	0.000***
MS2	1.67	0.87	1956	10 (1)	47 (2)	318 (16)	502 (26)	1079 (55)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.7.1.3 Roles of Parents to Ensure Students' Understanding of Ethical, Legal and Health Issues Involved in Using IT

Parents were generally concerned about ethical, legal and health issues in relation to students' use of IT

The EMB has encouraged schools and the Parent-Teacher Associations to hold activities related to cyber ethics for parents. As stated in 7.7.1.1, a relatively high proportion of schools or Parent-Teacher Associations (MS1: 67%; MS2: 75%) carried out activities or measures to encourage parents to instill proper principles, values and attitude in the use of IT into their children (Table 7.104, [S2]HQ13d). 18% and 23% of the parents participated in the talks on teaching children to use IT properly in MS1 and MS2 respectively (Table 7.105, [S7]option 4 of PQ18). Most of them showed their concerns about the ethical, legal and health issues involved in using IT. Table 7.109 ([S7]PQ14) showed a list of such concerns in which "avoid spending long hours on computer or online games" (84%) was parents' major concern. Their second major concern was "do not disclose personal particulars to strangers" (75%), followed by "do not visit pornographic websites" (67%). Other options such as "beware of e-mail bombs or the spread of computer virus" (58%), "do not use pirated (illegal) software" (47%) and "do not send or forward unnecessary e-mail or messages" (41%) were also important issues concerned by 41% or more of the parents. A statistically significant increase was noted in the following two concerns in MS2: "do not use pirated software" (from 47% to 51%) and "avoid spending long hours on computer or online games" (from 84% to 86%). However, a statistically significant decrease was noted in the concerns of "do not disclose personal particulars to strangers" (from 75% to 73%) and "beware of e-mail bombs or the spread of computer virus" (from 58% to 55%).

Table 7.109 Parents' concerns about ethical, legal and health issues in relation to students' use of IT ([S7]PQ14)

Social and ethical issues in relation to students' use of IT	Percentage (%) of Parents choosing the option		*P*-value
	MS1 (N=6030)	MS2 (N=4332)	
Avoid spending long hours on computer/online games	84	86	0.016*
Do not disclose personal particulars to strangers	75	73	0.021*
Do not visit pornographic websites	67	68	0.173
Beware of E-mail bombs or the spread of computer virus	58	55	0.003**
Do not use pirated (illegal) software	47	51	0.000***
Do not send/forward unnecessary E-mail/messages	41	40	0.552

*Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.*

7.7.1.4 Parents as Supporters and Motivators for Students' Learning with IT

"To monitor their children's use of Internet and assist them to develop the right online learning attitude" and "to provide IT facilities at home" were the two most important types of parental support perceived by school heads

When school heads were asked to rate the level of importance against parental support for students' learning with IT (Table 7.110, [S2]HQ12a-f), as reported in MS1, most of them indicated that monitoring children's use of the Internet and assisting them to develop the right online learning attitude (rated as important or very important by 95%) as well as the provision of IT facilities at home (rated as important or very important by 91%) were the two most important options. These were followed by "understanding their children's learning situation through school homepage or intranet" (87%) and "school e-learning platform" (81%) as well as "setting a good example by learning in a new era through learning about IT" (86%). "Choosing suitable digital resources for the children" was considered as the least important types of parental support among the listed items by school heads, but the perception was still positive (74% felt important or very important). These findings showed that school heads expressed high expectations on parental support for the implementation of ITEd. The mean ratings of all items fell in the range of 3.87 to 4.48 (SD:0.61-0.73) on a scale of 1 to 5 where 1 was 'totally not important' and 5 was 'very important'. No statistically significant difference was noted in MS2 for these items.

Most students had computers and broadband Internet access at home

As indicated by school heads, provision of IT facilities at home was one of the most important parental support for students' learning with IT after school. When parents and students were asked about the home ownership of computers, over 95% of the parents and students (96% of parents, 97% of S2, 98% of S4 and 97% of S6 students) reported that they had computers at home in MS1 (Table 7.111, [S7]PQ11, [S6]SQ8a). Regarding connectivity to the Internet, almost all parents and students (98% of parents, 96% of S2, 98% of S4 and 98% of S6 students) reported that they could access the Internet at home with 94% of the parents reported using broadband and 6% dial up connection in MS1 (Table 7.111, [S7]PQ12a,b, [S6]SQ8c). In MS2, there was a statistically significant decrease in the percentage of S4 students (from 98% to 95%) having computers at home in MS2. On the other hand, there was a statistically significant increase in the percentage of parents (from 97.6% to 98.4%) having Internet access at home in MS2. This broad picture indicated that computers were quite widely available at home for secondary school students.

Table 7.110 School heads' perception of the importance of parental support/encouragement to students' use of IT in learning ([S2]HQ12a-f)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very important		Important		Quite important (一般)		Not important				Very important		Important		Quite important (一般)		Not important		
a.	4.33	0.70	390	174	(45)	178	(46)	33	(8)	4 (1)	1 (0)	4.27	0.75	351	148	(42)	163	(46)	28	(8)	12 (3)	0 (0)	0.391
b.	3.87	0.69	390	60	(15)	231	(59)	88	(23)	11 (3)	0 (0)	3.86	0.69	351	51	(15)	211	(60)	79	(23)	9 (3)	1 (0)	0.866
c.	4.48	0.61	390	207	(53)	165	(42)	15	(4)	3 (1)	0 (0)	4.47	0.61	351	185	(53)	146	(42)	19	(5)	1 (0)	0 (0)	0.825
d.	4.00	0.73	390	87	(22)	232	(59)	58	(15)	11 (3)	2 (1)	3.96	0.68	351	69	(20)	202	(58)	76	(22)	4 (1)	0 (0)	0.169
e.	4.09	0.66	390	96	(25)	241	(62)	46	(12)	6 (2)	1 (0)	4.07	0.67	351	87	(25)	204	(58)	56	(16)	4 (1)	0 (0)	0.529
f.	4.14	0.70	390	118	(30)	217	(56)	49	(13)	5 (1)	1 (0)	4.14	0.69	351	106	(30)	192	(55)	50	(14)	2 (1)	1 (0)	0.868

Parental support/encouragement

a. To provide IT facilities at home

b. To choose other suitable digital resources for their child (children) apart from those provided by teachers

c. To monitor their child's (children's) use of the Internet and assist them to develop the right online learning attitude

d. To visit the school e-learning platform[#] so as to understand their child's (children)'s learning situation

e. To visit the intranet/school homepage so as to understand their child's (children)'s learning situation

f. To set a good example by learning in a new era through learning about IT

Mean: 1="Totally not important" and 5="Very important"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

Table 7.111 Students' home ownership of IT facilities ([S6]SQ8a,c, [S7]PQ11,12a,b)

	S2 students			S4 students			S6 students			Parents			
Having computers at home	**MS1 (N=2277)**	**MS2 (N=1859)**	***P*-value**	**MS1 (N=2178)**	**MS2 (N=1805)**	***P*-value**	**MS1 (N=1726)**	**MS2 (N=1432)**	***P*-value**	**MS1 (N=5998)**	**MS2 (N=4251)**	**P-value**	
YES	97	94	0.000 [a]	98	95	0.000*** [a]	97	97	0.862 [a]	96	96	0.165[a]	
NO	3	6		2	5		3	3		4	4		
Having Internet access at home	**(N=2215)**	**(N=1754)**		**(N=2127)**	**(N=1707)**		**(N=1682)**	**(N=1396)**		**(N=5341)**	**(N=3914)**		
YES	96	97	0.151 [a]	98	98	0.402 [a]	98	98	0.678[a]	98 (97.6)	98 (98.4)	0.027* [a]	
NO	4	3		2	2		2	2		2 (2.4)	2 (1.6)		
Type of Internet connection										**(N=5211)**	**(N=3850)**	$\chi^2_{(df=1)}$	***P*-value**
Broadband	-	-		-	-		-	-		94	95	2.76	0.097[b]
Dialup	-	-		-	-		-	-		6	5		

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to perceive the IT facilities at home as sufficient and they tended to be satisfied with the speed of Internet connection at home – a statistically significant increase was noted in these two aspects in MS2

Regarding the extent of opportunity for students to use computers at home, 84% of the parents in MS1 reported that their children had opportunity to use computers frequently or very frequently at home, with a mean rating of 4.40 (SD:0.83) on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. No statistically significant difference was found in MS2 (Table 7.112, [S7]PQ13). Regarding students' perception of the adequacy of IT facilities at home, 58% of S2, 51% of S4 and 49% of S6 students in MS1 considered that they were sufficient or very sufficient, with mean ratings of 3.51 (SD:1.20), 3.36 (SD:1.11) and 3.29 (SD:1.10) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant increase was found in students' perceived level of sufficiency of IT facilities at home (MS1: 49%-58%; MS2: 65%-71%) in MS2 (Table 7.112, [S6]SQ8b). Similar percentages of the students (57% of S2, 51% of S4 and 50% of S6) in MS1 were satisfied or very satisfied with the speed of Internet connection at home, with mean ratings of 3.48 (SD:1.21), 3.35 (SD:1.14) and 3.31 (SD:1.11) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 7.112, [S6]SQ8d). In MS2, a statistically significant increase was found in students' level of satisfaction with the speed of Internet connection at home (MS1: 50%-57%; MS2: 62%-65%).

Table 7.112 Parents' perception of the opportunities for students to use computers at home ([S7]PQ13) and students' perception of the sufficiency levels of IT facilities at home as well as their satisfaction levels with the speed of Internet connection at home ([S6]SQ8b,d)

Stakeholders		**Mean (1-5)**	**SD**	**N**	**Count (%) Parents choosing the option**					***P*-value**
					Very Frequently	**Frequently**	**Occasionally (間中)**	**Rarely**	**Never**	
Opportunity for students to use the computer(s) at home (Mean: 1="Never" and 5="Very frequently")										
Parents	MS1	4.40	0.83	5475	3236 (59)	1363 (25)	722 (13)	135 (2)	19 (0)	0.057
	MS2	4.37	0.84	3993	2264 (57)	1064 (27)	544 (14)	106 (3)	15 (0)	
Class levels		**Mean (1-5)**	**SD**	**N**	**Count (%) Students choosing the option**					***P*-value**
					Very sufficient	**Sufficient**	**Quite sufficient (一般)**	**Insufficient**	**Totally Insufficient**	
Levels of sufficiency of IT facilities at home (Mean: 1="Totally insufficient" and 5="Very sufficient")										
S2	MS1	3.51	1.20	2215	498 (23)	764 (35)	487 (22)	287 (13)	177 (8)	0.000***
	MS2	3.87	0.95	1754	467 (27)	768 (44)	377 (22)	102 (6)	40 (2)	
S4	MS1	3.36	1.11	2127	303 (14)	782 (37)	552 (26)	349 (16)	140 (7)	0.000***
	MS2	3.73	0.99	1707	368 (22)	739 (43)	425 (25)	117 (7)	58 (3)	
S6	MS1	3.29	1.10	1682	191 (11)	645 (38)	414 (25)	323 (19)	109 (6)	0.000***
	MS2	3.77	0.90	1396	281 (20)	653 (47)	340 (24)	104 (7)	18 (1)	
Class levels		**Mean (1-5)**	**SD**	**N**	**Count (%) Students choosing the option**					***P*-value**
					Very satisfied	**Satisfied**	**Quite satisfied (一般)**	**Not satisfied**	**Totally not satisfied**	
Levels of satisfaction with the speed of Internet connection at home (Mean: 1="Totally not satisfied" and 5="Very satisfied")										
S2	MS1	3.48	1.21	2133	461 (22)	753 (35)	447 (21)	297 (14)	175 (8)	0.000***
	MS2	3.75	1.03	1697	421 (25)	679 (40)	415 (24)	116 (7)	66 (4)	
S4	MS1	3.35	1.14	2075	310 (15)	745 (36)	529 (26)	335 (16)	156 (8)	0.000***
	MS2	3.72	0.96	1671	340 (20)	734 (44)	442 (26)	106 (6)	50 (3)	
S6	MS1	3.31	1.11	1653	210 (13)	619 (37)	402 (24)	316 (19)	106 (6)	0.000***
	MS2	3.65	0.95	1374	234 (17)	619 (45)	377 (27)	102 (7)	43 (3)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common parental support was allowing their children to read IT-related books

Parents were further asked about ways in which they showed support for their children's learning with the use of IT (Table 7.113, [S7]PQ15). In MS1, the most common support was allowing their children to read IT-related books (32%), followed by buying IT-related hardware or software (29%), allowing them to attend IT courses (26%), encouraging them to make use of community resources such as computer facilities in community centres and digital resources in libraries (23%) as well as buying educational software (21%) for them. No more than 17% of the parents indicated that they supported their children by reading IT-related books themselves (17%), participating in IT learning with their children (13%) and attending IT courses themselves (12%). A statistically significant decrease to 19% in the percentage of parents buying educational software for their children was found in MS2.

Table 7.113 Ways of parental support for their children on using IT in learning ([S7]PQ15)

Ways of parental support	Percentage (%)		*P*-value
	MS1 (N=6030)	MS2 (N=4305)	
Allowing your child to read IT -related books	32	33	0.208
Buying IT-related hardware/software for your child	29	28	0.291
Allowing your child to attend IT courses	26	26	0.388
Encouraging your child to make use of community resources (e.g. computer facilities in community centres and digital resources in libraries)	23	22	0.083
Buying educational software for your child	21	19	0.005**
Reading IT-related books yourself	17	16	0.077
Participating in IT learning with your child	13	12	0.37
Attending IT courses yourself	12	11	0.342
Other support	12	12	0.468
No special support	32	34	0.155

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Except S6 students who were quite satisfied (一般) with the technical support from family, S2 and S4 students tended to be satisfied with the technical and learning support from family

Other types of family support include technical support and learning support. In MS1, 39% to 62% of the students were satisfied or very satisfied with the technical support (62% of S2, 48% of S4 and 39% of S6) and learning support (61% of S2, 51% of S4 and 45% of S6) from family. A statistically significant increase was observed in S4 students' perceived level of satisfaction with the technical support from the family (from 48% to 53%) in MS2 (Table 7.114, [S6]SQ9b.ii, 15c.ii). Students' responses revealed a reasonable level of satisfaction with the support from family.

Table 7.114 Students' levels of satisfaction with the technical support and learning support from family ([S6]SQ9b.ii, 15c.ii)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the technical support from family															
S2	MS1	3.70	1.01	2276	511	(22)	904	(40)	619	(27)	160	(7)	82	(4)	0.050
	MS2	3.65	1.00	1852	385	(21)	696	(38)	585	(32)	111	(6)	75	(4)	
S4	MS1	3.43	0.99	2177	292	(13)	765	(35)	822	(38)	188	(9)	110	(5)	0.004*
	MS2	3.52	1.02	1804	295	(16)	665	(37)	620	(34)	126	(7)	98	(5)	
S6	MS1	3.20	1.01	1726	150	(9)	511	(30)	737	(43)	199	(12)	129	(7)	0.588
	MS2	3.22	0.98	1432	118	(8)	446	(31)	585	(41)	199	(14)	84	(6)	
Levels of satisfaction with the learning support from family															
S2	MS1	3.73	0.89	1297	250	(19)	549	(42)	418	(32)	51	(4)	29	(2)	0.137
	MS2	3.76	0.92	1017	221	(22)	422	(42)	312	(31)	35	(3)	27	(3)	
S4	MS1	3.54	0.84	1081	124	(11)	430	(40)	450	(42)	55	(5)	21	(2)	0.671
	MS2	3.53	0.90	874	126	(14)	305	(35)	375	(43)	43	(5)	25	(3)	
S6	MS1	3.38	0.88	685	60	(9)	246	(36)	292	(43)	66	(10)	20	(3)	0.616
	MS2	3.40	0.82	571	35	(6)	232	(41)	244	(43)	44	(8)	15	(3)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Parents tended to be willing to invest more resources for their children to use IT in learning

Parents showed positive attitude and contributed in various ways to support students' learning with IT. In MS1, 43% of the parents were willing or very willing to invest more resources such as time and money for their children to use IT in learning, with a mean rating of 3.41 (SD:0.72) on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. No statistically significant difference was found in MS2 (Table 7.115, [S7]PQ16).

Table 7.115 Parents' levels of willingness to invest more resources for their children to use IT in learning [S7]PQ16)

	Mean (1-5)	SD	N	Count (%) of Parents choosing the option										*P*-value
				Very willing		Willing		Maybe (一般)		Not very willing (不願意)		Totally not willing		
MS1	3.41	0.72	5870	301	(5)	2243	(38)	2960	(50)	293	(5)	73	(1)	0.220
MS2	3.39	0.71	4257	209	(5)	1569	(37)	2201	(52)	232	(5)	46	(1)	

Mean: 1="Totally not willing" and 5="Very willing"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.7.2 Community-wide Involvement

Promoting community-wide support is emphasized by the EMB. This support could be enhanced by collaborative schemes and partnership with private sector and NGOs in terms of training for teachers or IT technical staff and providing digital resources. The extent of schools making use of community resources and taking part in school-community collaboration activities indicates the achievement of the EMB measures in this regard.

7.7.2.1 Community-school Collaboration

Amongst those schools which launched pilot schemes or sharing activities, 35% and 33% of the schools collaborated with "local tertiary institutions" and "local community or commercial organisations" to launch pilot projects respectively while around two-fifths of the schools collaborated with "local primary, secondary and special schools" and 30% with "local community or commercial organisations" to organise sharing activities on the use of IT for teaching in MS1

The extent of the involvement of schools in community-school collaboration activities is studied in this survey. School heads were asked about how their schools collaborated with community organisations in pilot schemes or sharing activities on the use of IT for teaching. Among the 114 secondary schools which launched pilot projects on the use of IT for teaching in the 2004/05 school year in MS1, slightly over half of these schools (54%) had collaborated with other organisations (Tables 7.100, [S2]HQ16a,b). 35% of the these schools collaborated with "local tertiary institutions", 33% with "local community or commercial organisations" and 32% with the "EMB". Very few of them (11%) collaborated with overseas schools/community organisations/commercial organisations/ tertiary institutions. No statistically significant difference was found in the percentages of schools organising collaboration activities with other organisations in MS2 (Table 7.116, [S2]HQ16c).

Among the 131 secondary schools which organised sharing activities on the use of IT for teaching in the 2004/05 school year, 69% of these schools had collaborated with other organisations (Table 7.58, [S2]HQ17a,b). A slightly more than two-fifths of these schools (43%) most often collaborated with "local primary, secondary and special schools", followed by "local community or commercial

organisations" (30%), the "EMB" (27%) and "local tertiary institutions" (21%). 13% and 4% of these schools organised sharing activities with organisations or tertiary institutions in Mainland China and Macao or overseas respectively. No statistically significant difference was found in MS2 (Table 7.116, [S2]HQ17c).

Table 7.116 Organisations which jointly organised pilot schemes and sharing activities on the use of IT for teaching with schools ([S2]HQ16c,17c)

Organisations	Percentage (%) of School heads choosing the options					
	Pilot schemes			Sharing activities		
	MS1 (N=62)	MS2 (N=42)	*P*-value	MS1 (N=79)	MS2 (N=66)	*P*-value
Local tertiary institutions	35	43	0.450	21	29	0.271
Local community/commercial organisations	33	33	0.955	30	42	0.110
Education and Manpower Bureau	32	48	0.116	27	33	0.369
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	30	19	0.188	13	11	0.608
Local primary, secondary, and special schools	24	21	0.744	43	29	0.064
Oversea schools/community organisations/commercial organisations/tertiary institutions	11	7	0.484	4	5	0.976

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Around 10% of the teachers participated in ITEd professional development programmes or activities run by the IT industries, tertiary institutions and the HKEdCity respectively

Community also provided ITEd professional development programmes or activities for teachers. When teachers were asked about their actual participation in ITEd professional development programmes or activities in the 2004/05 school year, as reported in MS1, these programmes or activities were run by organisations such as their schools (72%) and the EMB (45%). Less than 13% of the teachers indicated that they had participated in the professional development programmes or activities provided by outside bodies like "other schools" (12%), the "HKEdCity" (8%), "IT industries" (12%), "tertiary institutions" (11%) and other professional or non-governmental organisations (1%-4%) (Table 7.117, [S5]TQ22b). A statistically significant decrease was noted in the percentage of teachers who had participated in these programmes organised by the "Hong Kong Professional Teachers' Union" (from 3% to 1%) while a statistically significant increase was observed in the percentages of teachers who had participated in these programmes organised by the "Hong Kong Federation of Education Workers" (from 1% to 2%) in MS2.

Table 7.117 The organisations that teachers participated in the ITEd professional development programmes/activities ([S5]TQ22b)

Organisations/institutions which organised ITEd professional development programmes/activities	Percentage (%)		*P*-value
	MS1 (N=1264)	MS2 (N=704)	
Your school	72	71	0.632
Education and Manpower Bureau [including Centres of Excellence (CoEs)]	45	45	0.807
Other schools	12	12	0.925
IT industries	12	13	0.271
Tertiary institutions (Please specify:_____)	11	12	0.613
HKEdCity	8	8	0.938
The Hong Kong Association for Computer Education	4	4	0.533
The Hong Kong Computer Society	3	3	0.86
Hong Kong Professional Teachers' Union	3	1	0.036*
Hong Kong Federation of Education Workers	1	2	0.001**
Your school	72	71	0.632
Others	3	2	0.645

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.7.2.2 Community Resources

School heads were quite satisfied (一般) that their schools made use of community resources and took part in community activities on the promotion of ITEd

For the use of community resources, 21% of school heads were satisfied or very satisfied that students and parents made appropriate use of community resources such as computer facilities in community centres and digital resources in libraries in MS1. The percentage significantly increased statistically to 30% in MS2 (Table 7.108, [S1]HSQ7d). In MS1, 24% of school heads were satisfied or very satisfied that their schools made use of community resources such as Partners in Learning (PiL) and took part in community activities on the promotion of ITEd. No statistically significant difference was found in MS2 (Table 7.118, [S1]HSQ7c).

Table 7.118 School heads' levels of satisfaction with making use of community resources and taking part in community activities on the promotion of ITEd ([S1]HSQ7c,d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option										*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"The school always makes use of community resources [e.g. Partners in Learning (PiL) 育才計劃] and takes part in community activities on the promotion of ITEd."														
MS1	3.05	0.75	397	12	(3)	84	(21)	217	(55)	81	(20)	3	(1)	0.155
MS2	3.12	0.73	354	12	(3)	80	(23)	206	(58)	52	(15)	4	(1)	
"Students and parents make appropriate use of the community IT facilities and digital resources (e.g. computer facilities in the community centres and digital resources in the libraries)."														
MS1	3.07	0.64	397	4	(1)	81	(20)	253	(64)	57	(14)	2	(1)	0.003**
MS2	3.21	0.64	354	6	(2)	98	(28)	216	(61)	32	(9)	2	(1)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers tended to perceive the support from the community as beneficial and they perceived a higher level of agreement to the benefit of using the community IT facilities or digital resources to help needy students to lessen the digital divide

ITEd team teachers perceived the support from the community as significant (Table 7.119, [S4]ITQ7d.i-v). In MS1, 73% of the ITEd team teachers agreed or strongly agreed that the community IT facilities or digital resources could effectively help needy students to lessen the digital divide. Around 65% of them agreed or strongly agreed that the use of community IT facilities or digital resources as beneficial to the following: to provide opportunities for schools to upkeep the latest ITEd development trend in the education sector (66%), to enhance sharing and collaboration in the use of IT for teaching between schools and the community (65%), to reduce schools' burden in developing IT facilities and digital resources (65%) as well as to provide requisite technical support for the development of ITEd in school (64%). No statistically significant difference was found in MS2.

School heads perceived that the EMB made significant contributions to school development in ITEd

With regard to the extent of the contribution level of the provision of IT facilities and digital resources from different organisations to ITEd in schools, as reported in MS1, most of school heads (86%) perceived that the EMB made considerable or significant contributions to school development in ITEd. Less than half of them indicated that "software or hardware service providers" (49%), "Internet service providers" (48%) and "IT application system developers" (42%) made considerable or significant contributions. Lower percentages of school heads considered that "tertiary institutions" (24%), "local primary, secondary and special schools" (18%), "professional education organisations" (18%), "other government policy departments or bureau" (7%) and "community organisations or centres" (5%) made considerable or significant contributions, with mean ratings below 3.00. No statistically significant difference was found in MS2 except for the contribution from community organisations or centres. The percentage significantly increased statistically from 5% to 6% (Table 7.120, [S2]HQ14a.i-xi).

ITEd team teachers perceived that IT facilities or resources provided by the HKEdCity were quite sufficient (一般)

When asked about the sufficiency of community IT facilities or resources as listed in Table 7.121 ([S4]ITQ7b.i-x), less than 20% of the ITEd team teachers in MS1 found the support provided by the following organisations or institutions to be sufficient or very sufficient: the EMB (19%), tertiary institutions (13%), IT-related professional organisations such as Hong Kong Computer Society and Hong Kong Association for Computer Education (6%-7%), non-governmental organisations such as Hong Kong Professional Teachers' Union and Hong Kong Federation of Education Workers (4%) and IT industry (e.g. Partners in Learning) (8%). The mean ratings fell in the range of 2.37 to 2.81 (SD:0.71-0.81) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. The only exception was the HKEdCity. 36% of the ITEd team teachers found the support for be sufficient or very sufficient with a mean rating of 3.22 (SD:0.75) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was found in MS2.

In general, 27% of the ITEd team teachers in MS1 perceived the provision of community IT facilities or digital resources to be insufficient or totally insufficient whereas 17% of them rated sufficient or very sufficient, with a mean rating of 2.87 (SD:0.75) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted in MS2 (Table 7.122, [S4]ITQ7c). Similarly, 23% of school heads in MS1 considered such resources as sufficient or very sufficient whereas 29% of them rated insufficient or very insufficient, with a mean rating of 2.93 (SD:0.79) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. There was a statistically significant increase (from 23% to 30%) in MS2 (Table 7.122, ([S2]HQ14b).

Table 7.119 ITEd Team teachers' levels of agreement on the benefits of community IT facilities/digital resources ([S4]ITQ7d.i-v)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							
				Strongly agree		Agree		Neutral		Disagree		Strongly disagree										
i.	3.61	0.76	339	21	(6)	197	(58)	93	(27)	24	(7)	4	(1)	3.65	0.80	228	23	(10)	124	(54)	63	(28)	15	(7)	3	(1)	0.532
ii.	3.66	0.83	339	37	(11)	184	(54)	88	(26)	25	(7)	5	(1)	3.59	0.94	228	30	(13)	112	(49)	53	(23)	28	(12)	5	(2)	0.535
iii	3.82	0.76	339	49	(14)	199	(59)	75	(22)	12	(4)	4	(1)	3.79	0.81	228	37	(16)	122	(54)	57	(25)	9	(4)	3	(1)	0.716
iv.	3.67	0.70	339	24	(7)	196	(58)	105	(31)	10	(3)	4	(1)	3.64	0.81	228	26	(11)	113	(50)	73	(32)	13	(6)	3	(1)	0.707
v.	3.66	0.75	339	25	(7)	200	(59)	95	(28)	13	(4)	6	(2)	3.67	0.84	228	30	(13)	113	(50)	68	(30)	13	(6)	4	(2)	0.987

Benefits of community IT facilities/digital resources

i. To provide requisite technical support for the development of ITEd in school
ii. To reduce school's burden in developing IT facilities and digital resources
iii. To help needy students to lessen the digital divide
iv. To enhance sharing and collaboration on the use of IT for teaching between school and the community
v. To provide opportunities for school to upkeep with the latest ITEd development and trend in the education sector

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.120 School heads' perception of contribution from community organisations to ITEd in schools ([S2]HQ14a.i-xi)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							
				Significant contribution		Considerable contribution		Some contribution (一般)		Little contribution		None										
i.	4.19	0.69	390	132	(34)	204	(52)	50	(13)	4	(1)	0	(0)	4.14	0.72	351	114	(32)	179	(51)	52	(15)	6	(2)	0	(0)	0.434
ii.	2.55	0.72	390	5	(1)	42	(11)	164	(42)	132	(34)	47	(12)	2.60	0.87	351	1	(0)	46	(13)	159	(45)	103	(29)	42	(12)	0.303
iii	2.36	0.70	390	6	(2)	20	(5)	142	(36)	162	(42)	60	(15)	2.42	0.81	351	1	(0)	15	(4)	170	(48)	111	(32)	54	(15)	0.088
iv.	2.89	0.69	390	13	(3)	80	(21)	170	(44)	105	(27)	22	(6)	2.89	0.96	351	10	(3)	82	(23)	154	(44)	71	(20)	34	(10)	0.627
v.	2.71	0.88	390	10	(3)	57	(15)	171	(44)	115	(29)	37	(9)	2.79	0.90	351	11	(3)	51	(15)	173	(49)	86	(25)	30	(9)	0.201
vi.	2.75	0.86	390	3	(1)	67	(17)	180	(46)	108	(28)	32	(8)	2.83	0.87	351	5	(1)	69	(20)	163	(46)	90	(26)	24	(7)	0.198
vii.	2.22	0.91	390	0	(0)	18	(5)	132	(34)	158	(41)	82	(21)	2.38	0.83	351	2	(1)	17	(5)	148	(42)	129	(37)	55	(16)	0.009**
viii.	2.57	0.92	390	2	(1)	52	(13)	159	(41)	130	(33)	47	(12)	2.63	0.91	351	3	(1)	49	(14)	162	(46)	90	(26)	47	(13)	0.243
ix.	3.35	0.86	390	11	(3)	178	(46)	142	(36)	55	(14)	4	(1)	3.31	0.86	351	16	(5)	142	(40)	140	(40)	42	(12)	11	(3)	0.562
x.	3.34	0.83	390	22	(6)	164	(42)	140	(36)	54	(14)	10	(3)	3.26	0.92	351	23	(7)	123	(35)	144	(41)	46	(13)	15	(4)	0.203
xi.	3.24	0.89	390	17	(4)	148	(38)	154	(39)	55	(14)	16	(4)	3.16	0.92	351	12	(3)	122	(35)	149	(42)	46	(13)	22	(6)	0.247

Organisations

i. Education and Manpower Bureau
ii. Commerce, Industry and Technology Bureau/Innovation and Technology Commission
iii. Other government policy departments/bureau
iv. Tertiary institutions
v. Local primary, secondary and special schools
vi. Professional education organisations
vii. Community organisations/centres
viii. Mass media (e.g. TV and radio)
ix. Software/hardware service providers
x. Internet service providers
xi. IT application system developers

Mean: 1="None" and 5="Significant contribution"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.121 ITEd Team teachers' perception of the sufficiency of IT facilities/resources provided by the community to schools ([S4]ITQ7b.i-x)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient									
i.	2.81	0.81	339	0	(0)	66	(19)	162	(48)	92	(27)	19	(6)	2.84	0.87	228	6	(3)	39	(17)	109	(48)	60	(26)	14	(6)	0.874
ii.	3.22	0.75	339	5	(1)	118	(35)	167	(49)	43	(13)	6	(2)	3.14	0.80	228	7	(3)	65	(29)	113	(50)	39	(17)	4	(2)	0.179
iii	2.67	0.80	339	1	(0)	45	(13)	157	(46)	113	(33)	23	(7)	2.70	0.91	228	8	(4)	25	(11)	105	(46)	70	(31)	20	(9)	0.881
iv.	2.59	0.73	339	0	(0)	22	(6)	181	(53)	110	(32)	26	(8)	2.64	0.86	228	6	(3)	18	(8)	112	(49)	71	(31)	21	(9)	0.694
v.	2.62	0.71	339	0	(0)	25	(7)	182	(54)	111	(33)	21	(6)	2.66	0.84	228	6	(3)	19	(8)	112	(49)	73	(32)	18	(8)	0.844
vi.	2.40	0.73	339	0	(0)	13	(4)	145	(43)	144	(42)	37	(11)	2.50	0.82	228	5	(2)	10	(4)	103	(45)	87	(38)	23	(10)	0.174
vii.	2.37	0.76	339	0	(0)	14	(4)	142	(42)	139	(41)	44	(13)	2.46	0.82	228	5	(2)	8	(4)	100	(44)	90	(39)	25	(11)	0.290
viii.	2.60	0.74	339	0	(0)	26	(8)	178	(53)	110	(32)	25	(7)	2.59	0.79	228	5	(2)	11	(5)	116	(51)	78	(34)	18	(8)	0.598
ix.	2.39	0.75	339	1	(0)	12	(4)	145	(43)	140	(41)	41	(12)	2.45	0.81	228	5	(2)	5	(2)	103	(45)	89	(39)	26	(11)	0.486
x.	2.65	0.88	20	0	(0)	3	(15)	9	(45)	6	(30)	2	(10)	3.00	0.82	13	0	(0)	4	(31)	5	(38)	4	(31)	0	(0)	0.300

Organisations

i. Education and Manpower Bureau
ii. HKEdCity
iii. Tertiary institutions
iv. The Hong Kong Computer Society
v. The Hong Kong Association for Computer Education
vi. Hong Kong Professional Teachers' Union
vii. Hong Kong Federation of Education Workers
viii. IT Industries [e.g. Partners in Learning (PiL) 育才計劃]
ix. Voluntary organisations
x. Others

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 7.122 School heads' and ITEd Team teachers' perception of the sufficiency of IT facilities/resources provided by the community to schools ([S2]HQ14b, [S4]ITQ7c)

Stakeholder	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient									
ITEd Team teachers	2.87	0.75	339	1	(0)	59	(17)	188	(55)	77	(23)	14	(4)	2.86	0.83	228	4	(2)	41	(18)	114	(50)	58	(25)	11	(5)	0.804
School heads	2.93	0.79	390	4	(1)	87	(22)	187	(48)	102	(26)	10	(3)	3.07	0.76	351	1	(0)	105	(30)	172	(49)	65	(19)	8	(2)	0.007**

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.7.2.3 Students' Participation in Activities Provided by the Community

More students reported using computers in public libraries than in community centres or youth centres

When students were asked to indicate their usage of community IT facilities, more secondary school students reported using computer in public libraries (28% of S2, 26% of S4 and 30% of S6) than in community centres or youth centres (9% of S2, 4% of S4 and 6% of S6) in MS1. A statistically significant decrease was observed in the percentage of S2 students using computers in others' home (from 53% to 47%) whereas a statistically significant increase was found in those using computers in other schools (from 2% to 3%) in MS2. For S4 students, a statistically significant increase was observed in the percentages of students using computers in other schools (from 2% to 4%), community centres or youth centres (from 4% to 6%) and Internet Café (from 20% to 24%) in MS2 (Table 7.123, ([S6]SQ8e).

Table 7.123 Locations that student used computers other than at their own school and at home ([S6]SQ8e)

Locations	Percentage (%) of Students choosing the options								
	S2			S4			S6		
	MS1 (N=2279)	MS2 (N=1850)	*P*-value	MS1 (N=2182)	MS2 (N=1789)	*P*-value	MS1 (N=1727)	MS2 (N=1427)	*P*-value
Others' home (e.g. fellow students/friends/relatives)	53	47	0.000 ***	50	52	0.238	50	50	0.747
Other schools	2	3	0.033*	2	4	0.000***	2	2	0.557
Community centres/Youth centres	9	8	0.388	4	6	0.001**	6	6	0.479
Public libraries	28	27	0.563	26	24	0.115	30	33	0.063
Internet Café	19	21	0.067	20	24	0.000***	12	10	0.095
Others	10	11	0.511	8	9	0.194	7	6	0.338
Only use the computers in school/at home	49	48	0.443	47	44	0.171	47	47	0.700

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students were quite satisfied (一般) with the technical and learning support from the community

As for the technical support, 23% of S2, 17% of S4 and 14% of S6 students were satisfied or very satisfied with the technical support from the community in MS1 (Table 7.124, [S6]SQ9b.iii). Among those students who received learning support from others during the learning process, 27%, 21% and 17% of S2, S4 and S6 students respectively reported that they found the learning support from the community to be satisfied or very satisfied (Table 7.124, [S6]SQ15c.iii). A statistically significant increase was observed in S4 students' satisfaction level with the technical support (from 17% to 22%) and learning support (from 21% to 27%) from the community in MS2.

Table 7.124 Students' levels of satisfaction with the technical support and learning support from the community ([S6]SQ9b.iii, 15c.iii)

Class levels		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the technical support from the community															
S2	MS1	2.99	0.91	2274	115	(5)	398	(18)	1286	(57)	289	(13)	186	(8)	0.557
	MS2	3.01	0.96	1853	121	(7)	331	(18)	1011	(55)	227	(12)	164	(9)	
S4	MS1	2.86	0.89	2175	67	(3)	302	(14)	1279	(59)	305	(14)	222	(10)	0.000***
	MS2	2.95	0.93	1799	80	(4)	320	(18)	1020	(57)	197	(11)	183	(10)	
S6	MS1	2.76	0.86	1722	26	(2)	209	(12)	1004	(58)	295	(17)	188	(11)	0.096
	MS2	2.82	0.83	1431	27	(2)	178	(12)	867	(61)	229	(16)	130	(9)	
Levels of satisfaction with the learning support from the community															
S2	MS1	3.10	0.91	1297	86	(7)	261	(20)	739	(57)	124	(10)	87	(7)	0.061
	MS2	3.16	0.91	1017	80	(8)	224	(22)	557	(55)	98	(10)	59	(6)	
S4	MS1	3.01	0.84	1081	44	(4)	182	(17)	663	(61)	122	(11)	70	(6)	0.001**
	MS2	3.11	0.86	874	44	(5)	191	(22)	511	(58)	76	(9)	52	(6)	
S6	MS1	2.92	0.83	685	22	(3)	98	(14)	415	(61)	104	(15)	46	(7)	0.638
	MS2	2.93	0.77	571	7	(1)	94	(17)	356	(62)	80	(14)	34	(6)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.7.3 Digital Divide

School heads tended to be satisfied with their schools setting up concrete programmes to minimize the effect of digital divide – a statistically significant increase was noted in this aspect in MS2

Regarding the concrete programmes that schools set up to minimize the effect of digital divide, 37% of school heads were satisfied or very satisfied with this aspect in MS1. The percentage significantly increased statistically to 45% in MS2 (Table 7.125, [S1]HSQ7b).

Table 7.125 School heads' levels of satisfaction with their schools setting up concrete programmes to minimize the effect of digital divide ([S1]HSQ7b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school sets up concrete programme(s) to minimize the effect of digital divide (數碼隔閡)."									
MS1	3.28	0.70	397	10 (3)	136 (34)	205 (52)	46 (12)	0 (0)	0.012*
MS2	3.39	0.67	354	7 (2)	153 (43)	168 (47)	24 (7)	2 (1)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Home computers and Internet access were widely available to secondary school students

A wide range of measures have been taken by the EMB to eliminate the 'digital divide'. 95% and 94% of the low income group families which had a monthly income below $10,000 had personal computers at home in MS1 and MS2 respectively. 90% and 91% of them had Internet access at home MS1 and MS2 respectively. 93% and 94% of them used broadband whereas 7% and 6% used dialup connection at home in MS1 and MS2 respectively (Table 7.126, [S7]PQ11,12a,b,25). These figures suggested that home computers and Internet access were quite widely available for secondary school students in the low income group.

Table 7.126 Families with personal computer, Internet access at home and mode of Internet connection by monthly family income ([S7]PQ11,12a,b,25)

IT facilities at home	Percentage (%) of families in secondary schools											
	MS1						MS2					
	Total Monthly income of the family per month				Association between digital divide and income		Total Monthly income of the family per month				Association between digital divide and income	
	Below $10,000 (N=1900)#	$10,000-30,000 (N=2754)#	Above $30,000 (N=744)#	Overall (N=5398)#	χ^2 (df=2)	*P*-value	Below $10,000 (N=1545)#	$10,000-30,000 (N=2013)#	Above $30,000 (N=461)#	Overall (N=4019)#	χ^2 (df=2)	*P*-value
Personal Computer (s)	95	98	97	96	32.20	0.000***	94	97	98	96	33.76	0.000***
Internet access	90	96	96	94	60.16	0.000***	91	96	98	94	51.91	0.000***
Mode of Internet	(N=1719)#	(N=2631)#	(N=717)#	(N=5067)#			(N=1403)#	(N=1932)#	(N=449)#	(N=3784)#		
-Broadband	93	95	94	94	6.77	0.030	94	95	96	95	2.91	0.233
-Dial up	7	5	6	6			6	5	4	5		

Number of response refers to valid cases related to corresponding computing. Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

Almost all schools opened computer rooms for students' use after school

Under the Second ITEd Strategy, computer recycling and donation in collaboration with the Parent-Teacher Associations or other parties to help needy students have been promoted in schools. Incentive grant for extending the opening hours of school computer facilities has been continually provided to help students with easy access to computers after school. In this regard, the extent of

schools' attempt to take measures to address the digital divide issues is investigated. School heads were asked about the measures carried out to help needy students in using IT in their learning after school (Table 7.127, [S2]HQ10a-e). In MS1, 90% or more of school heads indicated that they had opened computer rooms for students' use after school (98%) and loaned portable computers to poor and needy students for use at home (90%). A statistically significant increase was noted in the percentages of schools having students applying for computers from related organisations (from 15% to 29%) and those calling for donation or recycled computers from parents or students (from 6% to 17%) in MS2. As reported in Section 7.5.1.4, around 30% of students considered the opening hours of computer rooms beyond school hours to be sufficient or very sufficient in MS1. A statistically significant increase was reported in S2 students' level of sufficiency (from 29% to 37%) (Table 7.92, [S6]SQ7e). The results showed that initial measures in extending the opening hours of school facilities and provision of portable computers to needy students had been implemented by most of the schools, while further measure such as computer recycling had yet to be put forward.

Table 7.127 Measures taken to help needy students use IT in their learning after school in 2004/05 and 2005/06 school years ([S2]HQ10a-e)

Measures taken to help needy students use IT in their learning after school	**Percentage (%)**		***P*-value**
	MS1 (N=388)	**MS2 (N=347)**	
a. Computer room(s) was/were opened for students' use after school	98	99	0.273
b. Portable computers were loaned to poor/needy students for use at home	90	86	0.069
d. Students applied for computers (including recycled computers) from related organisations [e.g. non-government organisations (NGOs) and IT industries]	15	29	0.000***
e. Call for donation of/recycled computers from students/parents	6	17	0.000***
c. Arranged students to buy computer equipment by installments	3	5	0.136

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

7.8 Summary of the Section

7.8.1 Strategic Goal 1 Empowering Learners with IT

Proficiency in Computing Skills: The promotion of ITEd in schools produced positive outcomes on students' learning in terms of mastery of IT skills to use software and hardware. Students could master requisite IT knowledge and apply basic concepts and skills at their related learning stages. In MS1, majority of the surveyed students indicated that they were proficient or highly proficient in using software and hardware such as "online information searching tools" (70% of S2, 74% of S4 and 77% of S6), "online communication software" (72% of S2, 76% of S4 and 76% of S6), "keyboard" (73% of S2, 74% of S4 and 73% of S6) and "printer" (65% of S2, 65% of S4 and 64% of S6). Lower percentages of the students perceived themselves as proficient or highly proficient in "programming" (28% of S2, 21% of S4 and 14% of S6), using "audio or video editing software" (33% of S2, 31% of S4 and 23% of S6), "multi-media design software" (32% of S2, 25% of S4 and 16% of S6) and "mobile devices" (34% of S2, 28% of S4 and 23% of S6). A statistically significant increase was noted in the percentages of S6 students rating themselves as proficient or highly proficient in using "presentation software" (from 57% to 59%), "multi-media design software" (from 16% to 18%), "audio or video editing software" (from 23% to 27%) and all other hardware (MS1: 23%-59%; MS2: 29%-64%) except "printer", "CD-ROM writer" and "keyboard" in MS2. For S2 students, a statistically significant decrease was observed in using "presentation software" (from 63% to 59%), "online communication software" (from 72% to 69%), "computer graphic design" (from 44% to 41%) and "Chinese input" (from 56% to 53%) in MS2. For S4 students, a statistically significant decrease was observed in using "Spreadsheet" (from 44% to 42%), "presentation software" (from 64% to 57%), "online communication software" (from 76% to 69%) and "online information searching tools" (from 74% to 67%). A decrease was also noted in using "printer" (S2: from 65% to 58%, S4: from 65% to 59%), "keyboard" (S2: from 73% to 70%, S4: from 74% to 69%) for both S2 and S4 students in MS2. There was also a decrease in S2 students' perceived level of proficiency in using "CD-ROM writer" (from 55% to 52%) in MS2.

Attitude towards Social and Ethical Issues of Using IT: Students generally showed themselves as responsible users of IT. The responses illustrated that there was a reasonable level of awareness of social and ethical issues relating to the use of IT. Secondary school students showed greater concern about the issue of "beware of e-mail bombs or the spread of computer virus". [68% to 82% of the students agreed or strongly agreed to this item. A statistically significant difference was noted in the level of agreements to this statement for S4 (from 73% to 68%) and S6 students (from 80% to 82%) in MS2.] They were less concerned about the issues of "sending or forwarding unnecessary e-mails or messages" (38% of S2, 44% of S4 and 51% of S6 disagreed or strongly disagreed on this item in MS1) and "using pirated software" (40% of S2, 36% of S4 and 35% of S6 disagreed or strongly disagreed on this item in MS1). No statistically significant difference was noted in MS2.

Belief and Attitude towards Use of IT for Learning: Most students showed positive attitude towards the use of IT for learning. In MS1, around 80% of the students (80% of S2, 82% of S4 and 76% of S6) indicated that they liked to use computers for learning in class while around 60% of them (60% of S2, 62% of S4 and 58% of S6) liked to use computers for learning beyond school hours. A statistically significant decrease was noted in the percentages of S2 (from 80% to 79%) and S4 students (from 82% to 78%) who liked using computers for learning in class whereas a statistically significant increase was observed in that of S6 students (from 76% to 77%) in MS2. A statistically

significant increase was noted in the percentages of S2 (from 60% to 71%), S4 (from 62% to 69%) and S6 students (from 58% to 66%) who liked using computers for learning beyond school hours in MS2.

Learning Activities with IT: Students spent more time on computers at home or in other places than in school. According to MS1, more than 34% of the students (48% of S2, 35% of S4 and 37% of S6) spent less than 2 hours per day in school but around 25% of them (25% of S2, 25% of S4 and 26% of S6) spent less than 2 hours per day at home during the week prior to the conduct of the questionnaire survey. Respective percentages of students at different surveyed levels spending 2 to less than 5 hours on computers per day at home (32% of S2, 30% of S4 and 30% of S6) in MS1 were twice to those spending the same range of time using computers per day in school (16% of S2, 15% of S4 and 15% of S6). The average number of hours that students used computers per day in school significantly decreased statistically while the usage at home or in other places significantly increased statistically in MS2.

With respect to the learning activities with IT, students were given the opportunities to use computers in class other than Computer or IT lessons. In MS1, 72% of S2, 56% of S4 and 55% of S6 students reported that they had used computers 1 to 10 times in class while 16% of S2, 22% of S4 and 20% of S6 students reported that they used computers in class 11 times or more apart from Computer or IT lessons during the week prior to the conduct of the questionnaire survey. A statistically significant increase was found in the frequency of S6 students in using computers for learning 11 to 20 times in class (from 14% to 20%) whereas there was no statistically significant difference for S2 and S4 in MS2. Computers were used the most frequently in language subjects. The top two subjects which computers were used frequently for learning during lessons in MS1 were English Language/English Literature (12% for S2, 15% for S4 and 20% for S6 students) and Chinese Language/Chinese Literature (11% for S2, 12% for S4 and 12% for S6 students). There was a statistically significant increase in the percentages of S2 and S4 students choosing “English Language/English Literature” (S2: from 12% to 14%; and S4: from 15% to 18%) and S6 students choosing “Chinese Language/Chinese Literature” (S6: from 12% to 18%) in MS2.

Secondary school students engaged in different types of learning activities with the use of IT. Learning activities in school with the use of IT were mainly confined to information search. In MS1, 54%, 48% and 51% of S2, S4 and S6 students respectively frequently or very frequently used computers for “information search”. A relatively small proportion of the students (24% of S2, 19% of S4 and 13% of S6) in MS1 reported using IT to accomplish “self-evaluation on learning outcomes” frequently or very frequently. A statistically significant increase was noted in the frequency of using IT in “information selection” reported by S2 (from 31% to 35%), “information collation and analysis” reported by S2 (from 30% to 32%) and S4 (from 24% to 28%) and “self-evaluation on learning outcomes” reported by S6 students (from 13% to 14%) in MS2. A decrease was noted in the frequency of using IT in “reporting and presentation” reported by S2 students (from 38% to 35%) in MS2.

With respect to the learning activities beyond school hours with the use of digital resources, 47%, 39% and 38% of S2, S4 and S6 students respectively in MS1 made use of the digital resources assigned by teachers to learn subject knowledge beyond school hours. 43% of S2, 41% of S4 and 49% of S6 students in MS1 took the initiative to make use of digital resources for self-learning beyond school hours. A statistically significant decrease was noted in the percentages of students who used digital resources assigned by teachers (MS1: 38%-47%; MS2: 31%-38%) and on their own initiative for self-learning (MS1: 41%-49%; MS2: 30%-32%) beyond school hours in MS2.

Confidence in the Use of IT to Perform Learning Tasks: Students were generally confident in using IT for learning, especially in information search. In terms of the perceived levels of confidence in using IT to perform different learning tasks, around 70% of the students (69% of S2, 69% of S4 and 74% of S6) in MS1 rated themselves as confident or very confident in "information search". Around 50% of the surveyed students in MS1 rated themselves as confident or very confident in "information selection" (50% of S2, 51% of S4 and 52% of S6), "information collation and analysis" (48% of S2, 46% of S4 and 51% of S6) as well as "reporting and presentation" (51% of S2, 53% of S4 and 54% of S6). Whereas a lower percentage of the students rated themselves as confident or very confident in "self-evaluation on learning outcomes" (47% of S2, 44% of S4 and 42% of S6). A statistically significant increase was noted in the confidence level of S6 students in performing "information search" (from 74% to 77%) and "information selection" (from 52% to 57%) in MS2 whereas a statistically significant decrease was noted in the confidence level of S2 students in performing "reporting and presentation" (from 51% to 49%) in MS2.

As for the confidence level in the use of IT to perform respective computing tasks, higher proportions of students in MS1 rated themselves as confident or very confident in "searching information on the Internet" (70% of S2, 75% of S4 and 79% of S6) and "English input via the computer" (70% of S2, 72% of S4 and 77% of S6). On the other hand, around two-fifths of them in MS1 (44% of S2, 43% of S4 and 37% of S6) rated themselves as confident or very confident in "using e-learning platforms to conduct learning activities". In MS2, a statistically significant decrease was noted in the percentages of the S2 and S4 students who rated themselves as confident or very confident in "Chinese input" (S2: from 58% to 54%; and S4: from 64% to 59%) and "English input" (S2: from 70% to 65%; and S4: from 72% to 66%). There was also a statistically significant decrease in the percentages of the S4 students who rated themselves as confident or very confident in "using the computer for daily activities" (from 69% to 66%), "using the computer to store/retrieve digital resources" (from 71% to 65%) and "searching information on the Internet" (from 75% to 68%) in MS2. However, there was a statistically significant increase in the percentage of the S6 students who rated themselves as confident or very confident in "using the Internet/other digital resources to conduct learning activities assigned by teachers" (from 47% to 51%) in MS2.

Learning Support: Students considered the support from teachers to be quite sufficient (一般) when they encountered difficulties in performing the learning activities with the use of IT, whereas teachers indicated that they occasionally provided learning support for the students. In MS1, around a quarter of the students (28% of S2, 25% of S4 and 23% of S6) frequently or very frequently got learning support from their teachers when they encountered difficulties in performing the learning activities with the use of IT. A statistically significant increase was noted in the level of frequency that teachers (20% to 22%) and S2 students (from 28% to 31%) provided or received learning support respectively in MS2. Regarding the sufficiency of learning support provided by teachers, a statistically significant increase was observed in the percentages of students (MS1: 25%-33%; MS2: 28%-42%) rating such support as sufficient or very sufficient in MS2.

School ITEd Curriculum: Concerning the opportunities given to students' use of IT in learning, school heads tended to be very satisfied that students were given the opportunities to learn about IT knowledge and skills. 80% of secondary schools offered Computer or IT subjects in both MS1 and MS2. Schools followed closely the guidelines of Information Technology Learning Targets in school IT curriculum. Information-processing skills and presentation skills were expected to be developed in lower secondary levels. Awareness of the legal, social and ethical responsibilities in using IT was also emphasized in this stage. In MS1, "Word processing software" (97%), "Chinese input" (90%), "online

communication software" (83%), "online information searching tools" (81%), the use of "printer" (75%) and " keyboard" (85%) were taught mainly in S1 while "spreadsheet" was taught mainly in S2 (73%). "Multi-media design" (62%), "web design or editing software" (59%) and "network devices (44%) were mainly taught in S3. "Information search" (89%) was mainly taught in S1. Other information-processing skills as well as moral and ethical issues of using IT were taught from S1 to S3 as reported by 38% to 65% of the surveyed secondary schools. A statistically significant increase was noted in teaching the contents of the correct attitude towards using IT at lower secondary levels.

7.8.2 Strategic Goal 2 Empowering Teachers with IT

Teachers' IT competency: Secondary school heads were satisfied with teachers' IT competency. In general, secondary school teachers were proficient in using basic software and hardware. Teachers were more proficient in using "word processing software", "online communication software", "online information searching tools", "presentation software" and in using standard input, output and storage devices in daily work such as "printer", "keyboard", "CD-ROM writer" and "digital camera". However, they were less proficient in using "multi-media design software", "audio or video editing software", "programming" as well as using the hardware of mobile agents such as "mobile devices" and "portable multi-media player devices" for edutainment. A statistically significant increase was noted in the percentages of the teachers rating themselves as proficient or highly proficient in using the following software and hardware in MS2: "spreadsheet" (from 57% to 61%), "multi-media design software" (from 15% to 16%), "programming" (from 10% to 13%), "audio or video editing software" (from 18% to 20%),"Chinese input" (from 50% to 53%), "digital Camera" (from 60% to 64%), "digital video recorder" (from 47% to 51%), "scanner" (from 53% to 57%), "mobile devices" (from 25% to 30%), "network devices" (from 28% to 31%) and "portable multi-media player devices" (from 23% to 27%).

Belief and Attitude towards Using IT for Learning and Teaching: Regarding the teachers' ITEd perception, teachers possessed positive attitude towards the impact of IT on learning and teaching. Teachers perceived a higher level of agreement that the use of IT could enhance teaching effectiveness, but they perceived a lower level of agreement that it could strengthen the relationship between teachers and students. With respect to their roles when applying IT in the learning, teaching and assessment processes, teachers perceived a higher level of agreement that they used IT to motivate students in the learning of KLAs as well as provided opportunities for students to acquire IT knowledge and skills, but they perceived a lower level of agreement that they used IT for monitoring and assessment of students' performance and learning progress. A statistically significant increase was noted in the willingness of teachers to allocate more time to apply IT in teaching (from 36% to 37% rating themselves as willing or very willing to do so) in MS2.

Teaching with IT: With regard to the application of IT, school heads were satisfied with teachers' use of IT in daily teaching and learning management as well as in cross-subject learning activities. The two subjects which computers were used frequently in MS1 were English Language/English Literature (16%) and Chinese Language/Chinese Literature (13%). The frequency of using computers in class by teachers increased. In MS2, the percentage of teachers (from 55% to 52%) using computers in class 1 to 10 times during the week prior to the conduct of the questionnaire survey significantly decreased statistically while the percentages of teachers (from 35% to 39%) using computers in class 11 times or more significantly increased statistically. As for the mode of computer usage, secondary school teachers mainly used computers for explanation and demonstration to the

whole class to support students in learning subject knowledge. Teachers occasionally conducted teaching by having students working individually with computers and they seldom had students working in groups with computers. There was no statistically significant difference between MS1 and MS2 in the frequency of the different ways in which teachers used IT to conduct teaching. Teachers occasionally used IT to design learning context to foster students' higher-order thinking capability and they tended to use IT to arrange small-group learning occasionally.

As for the use of digital resources, around two-thirds of the secondary school teachers assigned digital resources to students for learning subject knowledge beyond school hours in both MS1 and MS2. Among them, 68% of them assigned digital resources 1 to 4 times beyond school hours during the week prior to the conduct of the questionnaire survey. Although a statistically significant increase was noted in the frequency of teachers using all the listed electronic means for assessing or responding to students' learning situation except the means of e-mail in MS2, they rarely used the listed electronic means for these purposes.

Confidence in Using IT for Learning and Teaching: Concerning the confidence in using IT for learning and teaching, teachers tended to consider themselves as capable of integrating IT into their daily teaching. Teachers tended to be more confident in the selection of appropriate digital resources to conduct teaching and the use of IT to support students in learning subject knowledge but they perceived a lower level of confidence in arranging small-group learning as well as building a 'student-centred' learning environment with the use of digital resources. A statistically significant increase (from 52% to 56%) was noted in the teachers' perceived level of confidence in the selection of appropriate digital resources to conduct teaching in MS2.

Teachers perceived a higher level of agreement that their teaching could promote students' capability in information search, but they perceived a lower level of agreement that their teaching could promote students' capability in information collation and analysis as well as self-evaluation on learning outcomes. No statistically significant difference was noted in teachers' perceived level of agreement on their teaching in relation to promoting students' capability in performing all listed learning activities in MS2.

School Professional Development in ITEd for Teachers: 46% of the teachers had participated in ITEd professional development programmes in MS1 and there was a decrease to 35% in MS2. Over half of them showed their willingness for future participation in ITEd professional development in MS1. Teachers tended to find the ITEd professional development programmes to be practical and they found that these programmes were quite sufficient (一般) only. No statistically significant difference was observed in the sufficiency and the practicality levels of the professional development programmes or activities in MS2. Regarding their expectation of the themes and modes of professional development programmes or activities, the top three commonly selected themes were "IT application on subject or cross-curricular teaching", "using new technology in teaching" and "IT application on project-based or cross-curricular learning" and the top two commonly selected modes were "training courses" and "workshops".

School ITEd Sharing and Collaboration among Teachers: With respect to the promotion of ITEd, secondary school teachers tended to agree that they would share their teaching experience in using IT or teaching materials with colleagues and the others, but they perceived themselves having a lower level of capability to share their experience in promoting ITEd with the education community. A statistically significant increase was noted in their perceived capability to share their experience in promoting ITEd with the education community (from 14% to 15% of them rated capable or very capable to do so) in MS2.

Areas for Improvement of ITEd Development: Teachers perceived some difficulties or obstacles in using IT in teaching. They were most concerned about the increase of teaching workload arising from the use of IT and the unsuitable design of general classrooms for teaching with IT. A statistically significant decrease was spotted in MS2 in these two obstacles. The top three areas for improvement of ITEd development in Hong Kong were teachers' workload reduction, increase in IT experts or professionals in schools and the provision of digital resources for learning purposes. A statistically significant decrease was observed in the improvement area of workload reduction in MS2.

7.8.3 Strategic Goal 3 Enhancing School Leadership for the Knowledge Age

School ITEd Plan: School heads and their associates were guided to establish visions and goals as well as to build teams appropriate for their school contexts in integrating IT into school planning, curricula as well as learning and teaching processes. School heads perceived the highest level of satisfaction with their school ITEd plans covering the infrastructure requirements of schools. No statistically significant difference was noted in school heads' satisfaction level with school ITEd plans in MS2.

When formulating the school ITEd plans for the 2005/06 and 2006/07 school years, school heads ranked improving students' use of IT in their learning as the top priority. This was followed by improving digital resources and the IT infrastructure in schools and strengthening teachers' professional development on ITEd knowledge and its application. ITEd team teachers participated in many tasks for the promotion of school ITEd. They tended to have considerable participation in providing ITEd technical support for teachers, but they tended to have some participation in exchanging experience and insight on the use of IT in teaching with other schools/regions/countries when implementing school ITEd plans. In MS1, they rated themselves as having considerable or strong participation in the tasks of providing ITEd technical support for teachers (55%), encouraging other teachers to make appropriate use of IT in teaching (47%) and formulating the school-based ITEd plan (42%). A statistically significant increase was observed in the following tasks in MS2: "to participate in formulating the school-based ITEd plan in school" (from 42% to 49%), "to set clear objectives and guidelines on IT infrastructure for school" (from 36% to 46%), "to make recommendations to school on the allocation and use of IT facilities and digital resources" (from 38% to 49%), "to co-ordinate all matters related to ITEd in school" (from 39% to 47%) and "to exchange experience and insight on the use of IT in teaching with other schools/regions/countries" (from 20% to 24%).

The two major problems encountered often or most often by school heads in the implementation of ITEd plans in MS1 were teachers' heavy workload (63%) and lack of suitable educational software or digital resources (42%). A statistically significant decrease was noted in the problem of "insufficient IT facilities" (from 20% to 15% of school heads reported often or most often encountered this problem in implementing ITEd plans) in MS2.

Activities to Promote IT Culture: School heads tended to be satisfied with the collaborative team work and sharing among teachers in the use of IT for teaching in schools. In MS1, 34% of schools had organised sharing activities on the use of IT for teaching. Among them, 69% had organised the sharing activities with outside parties. Of these, 43% of them organised the activities with local schools. A statistically significant decrease was identified in the percentage of schools collaborating

with outside parties (from 69% to 49%) in MS2.

Resources and Support: The measure of merging the various IT grants and providing flexibility on the use of grants effectively enhanced schools' flexibility to allocate resources to support school-based ITEd plans and accountability for results. A statistically significant increase was noted in the percentage of schools receiving funding from the Quality Education Fund for IT-related projects (from 61% to 84%) in MS2. Moreover, school heads and ITEd Team Teachers were quite satisfied (一般) with the current funding model of the "Composite Information Technology Grant" (CITG). 28% of school heads and 24% of the ITEd team teachers in MS1 were satisfied or very satisfied with the current funding model of the CITG provided by the EMB to support ITEd. No statistically significant difference was identified in the satisfaction level of the ITEd Team teachers in MS2, but a statistically significant increase (from 28% to 55%) was spotted in MS2 for the satisfaction level of school heads.

School Professional Development in ITEd for School Heads: The measure to enhance school leadership by providing training on e-leadership and application of ITEd in professional development programmes for school heads was implemented. In MS1, around two-fifths of school heads participated in ITEd professional development programmes or activities. A statistically significant increase (from 26% to 73% who rated these programmes as effective or very effective) was noted in school heads' perceived level of effectiveness of the ITEd professional development programmes in helping their teaching, administration and managerial work in MS2. According to the surveyed school heads in MS1, the three most popular themes which should be included into ITEd professional development programmes or activities were using IT in school administration or managerial work (72%), formulation of school-based ITEd plans (54%) and using new technology in teaching (51%). As for the modes of professional development programmes or activities, the two most desirable modes rated by school heads were workshops (72%) and training courses (68%) in MS1. No statistically significant difference was noted in school heads' expectation of the themes in MS2 and a statistically significant decrease (from 72% to 65%) was observed in the mode of workshop in MS2.

School Heads' Willingness to Promote ITEd: In MS1, 35% of the surveyed secondary school heads were willing or very willing to allocate more time for the promotion of ITEd in schools. A statistically significant increase (from 35% to 76%) was noted in MS2 in school heads' level of willingness to allocate more time to promote ITEd.

7.8.4 Strategic Goal 4 Enriching Digital Resources for Learning

School Heads' Perception of Enriching Digital Resources for Learning: In MS1, 78% of school heads were satisfied or very satisfied with the acquisition of up-to-date digital resources for teachers' and students' use. 51% of them were satisfied or very satisfied that their schools developed quality school-based digital resources and a repository of on-line resources for all KLAs. 53% of them were satisfied or very satisfied that their schools derived an effective digital resource management mechanism to facilitate learning and teaching as well as sharing among teachers, parents and students. No statistically significant difference was found in school heads' level of satisfaction with all the aspects related to enriching digital resources for learning in MS2.

Sources of Digital Resources: In MS1, school heads considered the free digital resources downloaded from the Internet (except the HKEdCity) and digital resources purchased by the schools

as the important sources for learning and teaching (78% of school heads rated these two sources of digital resources as important or very important). The most common digital resources which teachers used frequently or very frequently were those provided by textbook publishers. A statistically significant increase was found in teachers' usage of digital resources developed by themselves (from 29% to 33% of the teachers used these resources frequently or very frequently) and the schools (from 9% to 12% of the teachers used these resources frequently or very frequently) in MS2.

Teachers and students tended to perceive that the digital resources were helpful for students' learning, no matter they were assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours. In MS1, 50% of the teachers and 34% to 41% of students found the digital resources to be helpful or definitely helpful for students' learning. A statistically significant increase was observed in students' perceived level of the helpfulness of digital resources in MS2 (MS1: 34%-41%; MS2: 54%-58%).

Teachers tended to consider the digital resources in schools as sufficient whereas students considered them as quite sufficient (一般). In MS1, 35% of the teachers, 28% of S2, 26% of S4 and 22% of S6 students perceived the provision of digital resources in schools as sufficient or very sufficient to meet their needs. A statistically significant increase was identified in S2 (from 28% to 35%) and S6 students' (from 22% to 23%) perceived level of the sufficiency of digital resources in schools in MS2.

Lack of suitable digital resources was one of the major problems that schools encountered when implementing school ITEd plans as perceived by school heads. As reported by the ITEd team teachers in MS1, the second greatest support needed by the secondary schools was increasing or upgrading digital resources. 66% of them indicated that they were quite in need or much in need of this support in MS1. There was no statistically significant difference between MS1 and MS2 in this area.

Digital Resources Repository: A statistically significant decrease was noted in the percentages of students using e-learning platforms for learning (MS1: 30%-45%; MS2: 23%-39%) in MS2 and there was no statistically significant difference in teachers' usage of e-learning platforms in MS2 (32% using the platforms for teaching in MS1). Amongst those who had used school e-learning platforms, 61% to 66% of the students and 71% of the teachers visited the platforms 1 to 10 times during the week prior to the conduct of the questionnaire survey in MS1. A slight increase was noted in the frequency of usage for teachers while a slight decrease was noted for students in MS2. Regarding the learning effectiveness of the e-learning platforms, students and teachers generally agreed that e-learning platforms could help students' learning [26% of the teachers and around 30% of the students (33% of S2, 30% of S4 and 26% of S6) agreed or strongly agreed with this]. A statistically significant increase was noted in students' level of agreement on the helpfulness of e-learning platforms to their learning in MS2 (MS1: 26%-33%; MS2: 34%-41%).

As for the usage of the HKEdCity, nearly half of the students and 57% of the teachers visited the HKEdCity in MS1 and a statistically significant decrease in students' usage of the HKEdCity was noted in MS2. Regarding the learning effectiveness of the HKEdCity, teachers and parents tended to perceive the HKEdCity to be effective in assisting students' learning whereas students perceived this website to be quite effective (一般) in doing so. In MS1, 37% of the teachers and around a quarter of the students (24% of S2, 25% of S4 and 23% of S6) as well as 32% of the parents considered the HKEdCity as effective or very effective in assisting students' learning. Teachers and students perceived that the learning materials provided by the HKEdCity were generally suitable (一般) for students. In MS1, 37% of the teachers and around a quarter of the students (26% of S2, 26% of S4 and

22% of S6) considered the learning materials provided by this website as suitable or very suitable for students' learning. A statistically significant increase was noted in S2 students' perceived level of the suitability of learning materials and the learning effectiveness of the HKEdCity (MS1: 24%-26%; MS2: 31%-32%) whereas a statistically significant decrease was noted in those of S6 students (MS1: 22%-23%; MS2: 16%-17%) in MS2.

7.8.5 Strategic Goal 5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

Access and Connectivity in Schools: School heads were satisfied that their schools provided sound and sufficient IT facilities for students and teachers. Hardware was improved in secondary schools. A statistically significant increase was noted in the average number of digital projectors for mobile use (from 2.94 to 3.03) and that for fixed installation (from 33.76 to 36.00) as well as that for general classrooms (from 20.96 to 22.94) in MS2. The numbers of desktop and notebook computers per secondary school were 198.16 and 72.25 respectively in MS1. No statistically significant difference was observed in the distribution of secondary schools with various numbers of computers per school. The majority of computers in secondary schools were located in special rooms. They were still not available in every classroom in school (an average of 17.19 computers including desktop and notebook were located in an average of 26.46 general classrooms per secondary school) in MS1. The number of computers allocated to an average of 27 general classrooms had significantly increased to an average of 18.98 computers in MS2. In MS1, the student-to-computer gross ratio (including all computers in school), student-to-computer net ratio (excluding computers in staff rooms and general office) and teacher-to-computer ratio (computers in staff rooms) were 3.91:1, 4.63:1 and 5.21:1 respectively. No statistically significant difference was noted in these ratios in MS2. As regards the provision of wireless technology, 71% of schools reported having at least 1 wireless LAN in schools in MS1. No statistically significant difference was identified in MS2.

As for the adequacy of IT facilities in schools, teachers perceived a higher level of sufficiency than that of students on school IT facilities to meet students' needs (49% of the teachers and 33% to 41% of the students considered the IT facilities as sufficient or very sufficient in MS1). A statistically significant increase was noted in students' perceived level of sufficiency (MS1: 33%-41%; MS2: 40%-48%) in MS2. Teachers tended to perceive the IT facilities in schools as sufficient to meet their teaching needs (46% rated these as sufficient or very sufficient in MS1). No statistically significant difference was noted in MS2.

The School ITEd Survey showed that all secondary schools had connection to the Internet through broadband in MS1 and MS2. A statistically significant increase was identified in the percentage of schools having a connection speed of 10Mbps or higher (from 75% to 84%) in MS2. In MS1, nearly all secondary schools (99%) had school websites and 92% had school intranets. A statistically significant increase was noted in the percentage of schools with e-learning platforms (from 75% to 83%) in MS2. As for the speed of the Internet connection in schools, secondary school teachers perceived a higher level of satisfaction than that of the students. 53% of the teachers and around 30% of the students (28% of S2, 29% of S4 and 34% of S6) were satisfied or very satisfied with the speed of Internet connection in schools. There was a statistically significant increase in S2 students' perceived level of satisfaction with this aspect (from 28% to 34%) in MS2.

Nearly all secondary schools had opened computer rooms for students after school. Students

considered the opening hours of computer rooms beyond school hours as quite sufficient (一般) (29% of S2, 30% of S4 and 30% of S6 considered such service as sufficient or very sufficient in MS1). There was a statistically significant increase in S2 students' (from 29% to 37%) perceived level of sufficiency in this aspect in MS2.

Management and Maintenance of IT Facilities and Technical Support Services: Regarding technical support services, students perceived that it was quite easy (一般) to get support when encountering technical problems in using computers. A statistically significant increase was noted in students' perceived level of easiness in getting such support (MS1: 31%-36%; and MS2: 37%-42% finding easy or very easy) in MS2. With regard to the channels from which the teachers could seek technical support, teachers considered that the technical support provided by IT technicians in schools was the most satisfactory channel. A statistically significant increase was noted in teachers' perceived level of satisfaction with the support from the EMB (from 19% to 23% of teachers were satisfied or very satisfied) in MS2, but a statistically significant decrease was observed in the perceived level of satisfaction with the support from friends and relatives (from 53% to 49%) in MS2.

Upgrading IT Facilities and Exploring Advanced IT Technology: With regard to the upgrading of IT facilities, students and teachers perceived that the IT infrastructure was quite sufficient (一般) to meet their needs. A statistically significant increase was noted in students' perceived sufficiency level of the IT infrastructure (MS1: 31%-37%; and MS2: 37%-45% rated such infrastructure as sufficient or very sufficient) in MS2. No statistically significant difference was identified for teachers in MS2. School heads were concerned about both conventional technologies and the advanced ones. In MS1, they indicated that IT infrastructure should be further consolidated by upgrading IT facilities. Computers and projectors in classrooms (58%), e-learning platforms (58%) and multi-media computer rooms (45%) were reported as the three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in secondary schools. There was a statistically significant increase in the need of interactive electronic whiteboards (from 14% to 20%) in MS2.

Teachers perceived the advanced IT facilities such as wireless network system in schools as quite sufficient (一般) to promote innovative teaching pedagogy (38% rated these facilities as sufficient or very sufficient). School heads perceived e-learning platforms (50%), mobile learning devices (44%) as well as computers and projectors in classrooms (42%) as the top three priorities for additional facilities or services which were needed for students' and teachers' use in secondary schools in MS1. The need for interactive electronic whiteboards (from 28% to 39%) significantly increased statistically while a statistically significant decrease in the need of wireless network (from 32% to 26%) was noted in MS2.

7.8.6 Strategic Goal 6 Providing Continuous Research and Development

School Heads' Perception of Continuous Research and Development in ITEd: In MS1, 34% of school heads were satisfied or very satisfied that their schools actively studied or evaluated the effectiveness of some innovative IT pedagogical strategies and shared the experience with the education community. 40% of them were satisfied or very satisfied with their schools' active participation in pilot projects or pilot schemes on teaching so as to explore the effectiveness of the innovative use of IT for learning and teaching enhancement. 27% of school heads were satisfied or very satisfied that the EMB could share the results of these projects with schools in order to assist

them in the promotion of ITEd. No statistically significant difference was noted in these three listed outcomes in MS2.

School ITEd Innovation: 31% of schools had launched pilot schemes or projects on the use of IT for teaching in the 2004/05 school year in MS1. Of the projects which the schools had joined with other organisations, 35% of schools collaborated with local tertiary institutions, 33% with local community or commercial organisations and 32% with the EMB. No statistically significant difference was noted in the percentage of schools participated in the pilot schemes on the use of IT for teaching in MS2. When implementing school ITEd plans, ITEd Team teachers had some participation in exploring new technology as well as researching and evaluating the effectiveness of ITEd in schools. 40% of the ITEd team teachers perceived that they had considerable or strong participation in exploring new technology and developing innovative teaching methods. 33% of them perceived that they had considerable or strong participation in performing research and evaluation on the effectiveness of ITEd in schools. No statistically significant difference was identified in these two areas in MS2.

Regarding the usefulness of the support and resources from EMB in developing teachers' ability in using IT for teaching, such as sharing the results of research-based projects with schools, teachers generally expressed a neutral attitude towards this aspect (15% in both MS1 and MS2 agreed or strongly agreed to this statement).

7.8.7 Strategic Goal 7 Promoting Community–wide Support and Community Building

Home-school Co-operation and Parents' Involvement: School heads were quite satisfied (一般) with their schools setting up concrete programmes to encourage parents' involvement in ITEd. A statistically significant increase was observed in this aspect (from 28% to 37%) in MS2. Secondary schools or the Parent-Teacher Associations in schools actively organised or carried out different home-school collaboration activities or measures in MS1: encouraging parents to understand situations in school through visiting school websites or intranets (87%), providing ITEd activities for parents (69%), encouraging parents to instill proper principles, values and attitude in the use of IT into their children (67%) and explaining the work of ITEd in schools to parents (49%). A statistically significant increase was noted in the percentages of schools having provided ITEd activities for parents (69% to 84%) and encouraged parents to instill the proper principles, values and attitude in the use of IT into their children (67% to 75%). Parents perceived that these activities were quite sufficient (一般) (24% of them rated these activities as sufficient or very sufficient in MS1 and no statistically significant difference was noted in MS2).

Regarding the home-school communication with e-learning platforms, responses from relevant stakeholders revealed that e-learning platform was still not a common means of communication amongst parents, teachers and schools. In MS1, 34% of the parents agreed or strongly agreed that the schools could effectively use the e-learning platforms to promote their communication with schools and teachers. No statistically significant difference was noted in MS2. A statistically significant increase was noted in teachers' level of willingness in using e-learning platforms to communicate with parents (from 24% to 25% of the teachers were willing or very willing to do so). Nonetheless, 86% of the teachers in MS1 rarely or never used e-learning platforms for this purpose, but the percentage significantly dropped statistically to 81% in MS2.

Parental support was essential for students' learning with IT. 96% of the parents provided computer facilities at home in both MS1 and MS2. A statistically significant increase was noted in the percentage of families having Internet access at home (from 97.6% to 98.4%) in MS2. Amongst those with Internet access, 94% and 95% of them had broadband connection at home in MS1 and MS2 respectively. A statistically significant increase was noted in the students' perceived sufficiency level of IT facilities at home (MS1: 49%-58%; MS2: 65%-71%) and their satisfaction level with the speed of Internet connection at home (MS1: 50%-57%; MS2: 62%-65%) in MS2. In MS1, parents supported their children's learning with the use of IT by allowing their children to read IT-related books (32%), buying IT-related hardware and software for their children (29%), allowing them to attend IT courses (26%) and encouraging them to make use of community resources (23%). A statistically significant decrease from 21% to 19% in the percentage of parents buying educational software for their children was found in MS2.

Community-wide Involvement: Community-school collaboration was still not very common. In MS1, out of the 114 secondary schools which launched pilot schemes on the use of IT for teaching, 54% of them had collaborated with other organisations. Amongst them, 35% of these schools collaborated with "local tertiary institutions", followed by "local community or commercial organisations" (33%) and the "EMB" (32%) in the 2004/05 school year. Out of the 131 secondary schools which had launched sharing activities on the use of IT for teaching, 69% of schools had collaborated with other organisations in the 2004/05 school year. Secondary schools most often collaborated with "local secondary, secondary and special schools" (43%). No statistically significant difference was found in the percentages of schools organising collaboration activities with other organisations in MS2.

Secondary school heads perceived that the EMB made significant contributions to school development in ITEd. In MS1, most of school heads (86%) perceived that the EMB made considerable or significant contributions of the provision of IT facilities and digital resources to school development in ITEd. Less than half of them thought that "software or hardware service providers" (49%), the "Internet service providers" (48%) and "IT application system developers" (42%) made considerable or significant contributions. Lower percentages of school heads considered that "tertiary institutions" (24%), "local secondary, secondary and special schools" (18%), "professional education organisations" (18%), "other government policy departments or bureau" (7%) and "community organisations or centres" (5%) made considerable or significant contributions to school development in ITEd. No statistically significant difference was found in MS2 except the contribution from community organisations or centres (from 5% to 6%).

With respect to community resources, the HKEdCity was considered by 36% of the ITEd team teachers in MS1 as the organisation having provided sufficient or very sufficient IT facilities and resources to schools. No statistically significant difference was noted in MS2. In MS1, 23% of school heads and 17% of the ITEd team teachers perceived the provision of community IT facilities or resources to be sufficient or very sufficient. The sufficiency level for school heads increased (from 23% to 30%) in this aspect in MS2. As for the usage of community IT facilities, more students reported using computers in public libraries (MS1: 26%-30%; MS2: 24%-33%) than in community centres or youth centres (MS1: 4%-9%; MS2: 6%-8%). A statistically significant decrease was observed in the percentage of S2 students using computers in others' home whereas a statistically significant increase was found in the use of computers in other schools for both S2 and S4 students as well as in Internet café for S4 students in MS2.

Digital Divide: Home computers and Internet access were widely available for secondary school students in the low income group (families with monthly income less than $10,000). 95% and 94% of the students in the low income group had personal computers at home while 90% and 91% of them had Internet access at home in MS1 and MS2 respectively. Amongst those with Internet access at home, 93% and 94% of them had broadband while 7% and 6% of them had dial-up connection in MS1 and MS2 respectively.

Many measures were implemented to bridge the digital divide. Secondary schools carried out measures to help needy students to use IT in their learning after school. The measure to continually extend the opening hours of school computer facilities to help students in need to access computers after school hours was effectively implemented. Almost all secondary schools (MS1: 98%; MS2: 99%) opened computer rooms for students' use after school. 90% and 86% of schools loaned portable computers to poor and needy students for use at home in MS1 and MS2 respectively. The measures to encourage computer recycling and donations to help needy students to bridge the digital divide were also progressively implemented. A statistically significant increase was noted in the percentages of schools having students applied for computers from related organisations (from 15% to 29%) and those calling for donation or recycled computers from parents or students (from 6% to 17%) in MS2.

Chapter 8 Major Findings and Discussion for Special School Sector

This chapter reports on the major findings and discussion of Main Study (I) (MS1) and Main Study (II) (MS2) about the progress of different ITEd implementation measures and the application of IT in special schools with respect to the seven strategic goals of ITEd as set out in the Second ITEd Strategy (EMB, 2004):

- Empowering learners with IT
- Empowering teachers with IT
- Enhancing school leadership for the knowledge age
- Enriching digital resources for learning
- Improving IT infrastructure and pioneering pedagogy using IT
- Providing continuous research and development
- Promoting community-wide support and community building

A snap-shot of each strategic goal is presented for two intervals, namely MS1 and MS2 respectively. The data are drawn from the self-evaluation on the expected outcomes of the strategic goals by school heads and the questionnaires from different stakeholder groups which portray the current situation and the relevant implementation practices of various strategic goals in special schools. ***The major findings are based on the results of MS1 which describe the situation of the implementation in the first stage of ITEd. The differences between the findings of MS1 and MS2 are then observed to track the progress of the implementation of ITEd from 2004/05 to 2006/07.***

The needs and competence level of students are different with respect to the types of special schools. It is anticipated that clearer picture about the current practices and opinions on ITEd for specific types of special schools could be depicted if the findings were discussed according to the school types. However, given the limited resources, the Project Team wishes to draw the attention of readers to the following limitations that may affect their interpretation about the findings of specific categories of special schools:

- ***The data from the Teachers', Students' and Parents' ITEd Questionnaires are analysed according to two major categories: Normal Curriculum (NC)[14] and Intellectual Disabilities (ID)*** [15] ***Curriculum.***
- ***The data from the Therapists' ITEd Questionnaire are analysed by different therapist types: Speech therapists (SPH), Physiotherapists (PHY) and Occupational therapists (OC).***
- ***As mentioned in Section 4.5, the Project Team was alerted of high students' absence rate and low parents' response rate in special schools. It is found that no data was collected from parents of the sampled School for Social Development (SSD) in both MS1 and MS2, parents of the students studying in sampled School for the Moderately Intellectually Disabled (ID-Mod) and School for Children with Physical Disability (PD) in MS1 as well as all stakeholder groups of sampled School for the Mildly Intellectually Disabled (ID-M) in MS2. As a result, the statistical tests are applied to the School Heads' (Part 1 and Part 2), Teachers' and Students' ITEd Questionnaires (NC) as well as the School ITEd Survey. Only items with statistically significant difference in MS2 are mentioned. Findings of other questionnaires in MS1 and MS2 are reported respectively.***

[14] Normal Curriculum (NC) schools — the special schools implementing mainstream curriculum which include the Hospital School (H), School for Children with Hearing Impairment (HI), School for Children with Physical Disability (PD), School for Social Development (SSD) and School for Children with Visual Impairment (VI).

[15] Intellectual Disabilities (ID) — School for Children with Intellectual Disability — the special schools implementing special curriculum which include School for the Mildly Intellectually Disabled (ID-M), Mildly and Moderately Intellectually Disabled (ID-Mmod), Moderately Intellectually Disabled (ID-Mod) and Severely Intellectually Disabled (ID-S).

8.1 Empowering Learners with IT

The first strategic goal of the Second ITEd Strategy is "Empowering learners with IT" which aims at fostering students with the necessary skills, knowledge and attitude for learning and problem-solving in the information age. To track the progress of this goal, the following aspects related to students' learning with IT are addressed:

- Proficiency in computing skills
- Attitude towards social and ethical issues of using IT
- Belief and attitude towards use of IT for learning
- Learning activities with IT
- Confidence in the use of IT to perform learning tasks
- Learning support
- School ITEd curriculum

8.1.1 Proficiency in Computing Skills

School heads tended to be satisfied with students' IT knowledge and skills

Learning with IT could not be achieved until students had acquired basic knowledge and skills of IT. In MS1, 41% of school heads were satisfied or very satisfied that students could master requisite IT knowledge and apply basic concepts and skills at their related learning stages. No statistically significant difference was noted in MS2 (Table 8.1, [E1-1/E1-2]HSQ1a[16]).

Table 8.1 School heads' levels of satisfaction with students' proficiency in computing skills ([E1-1/E1-2]HSQ1a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students can master requisite IT knowledge and apply basic concepts and skills at their related learning stages."									
MS1	3.37	0.68	54	2 (4)	20 (37)	28 (52)	4 (7)	0 (0)	0.877
MS2	3.31	0.70	52	0 (0)	22 (42)	25 (48)	4 (8)	1 (2)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Normal curriculum (NC) students were generally proficient in software and hardware skills

The first area in which students were asked to evaluate themselves was their proficiency in using software (Table 8.2, [E6-1]SQ15a-k, [E6-2/E6-3]SQ16a-k, [E6-4/E6-5/E6-6]SQ18a-k). Table 8.2 shows that the Normal curriculum (NC) students in MS1 gave higher mean self-ratings for their proficiency with all listed items than those of Intellectual Disabilities (ID) curriculum students. The mean ratings for the NC and ID students were 1.99-3.44 (SD:1.27-1.42) and 1.42-1.95 (SD:1.05-1.39) respectively on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'. The NC students rated themselves as proficient or highly proficient in using "online information searching tools" (52%), "Chinese input" (46%), "online communication software" (43%) and "word processing software" (42%). Less than 18% of ID students rated themselves as proficient or highly proficient in using "online communication software" (17%), "presentation software" (13%) and "Chinese input" (13%). Most of NC students and ID students indicated that they were not proficient or knew nothing

[16] [E1] refers to questionnaire code; HSQ refers to question item number for specific stakeholder. For details of different questionnaire titles, codes and stakeholders, please refer to Table 4.1 (p.30). Detailed descriptive statistics for special school sector for MS1 and MS2 are reported in Appendices 1.3 and 2.3 respectively.

about using “programming” (68% of NC and 88% of ID), “multi-media design software” (63% of NC and 85% of ID) and “web design or editing software” (59% of NC and 81% of ID).

Among the software listed in Table 8.2, no statistically significance difference was noted for NC students in MS2. For ID students in MS2, 20% or less rated themselves as proficient or highly proficient in using “online information searching tools” (20%), “online communication software” (17%) and “Chinese input” (16%). Over 70% of them rated themselves as not proficient or knew nothing about all listed types of software (72%-90%).

As for the proficiency in using hardware (Table 8.3, [E6-1]SQ16a-j, [E6-2/E6-3]SQ17a-j, [E6-4/E6-5/E6-6]SQ19a-j), a similar pattern was observed. The NC students in MS1 gave higher mean self-ratings for their proficiency with all hardware items than ID students. The mean ratings for the NC and ID students were 2.21-3.47 (SD:1.27-1.55) and 1.36-1.91 (SD:0.99-1.41) respectively on a scale of 1 to 5 where 1 was ‘knowing nothing at all’ and 5 was ‘highly proficient’. The NC students rated themselves as proficient or highly proficient in the “keyboard” (57%), “printer” (46%), “CD-ROM writer” (44%) and “digital camera” (37%). Less than 18% of the ID students rated themselves as proficient or highly proficient in the “keyboard” (17%), “digital camera” (15%) and “printer” (13%). Most of NC and ID students admitted that they were not proficient or knew nothing about using “mobile devices” (56% for NC and 89% for ID) and “network devices” (55% for NC and 87% for ID).

For the hardware shown in Table 8.3, a statistically significant increase was observed in the percentage of NC students who rated themselves as proficient or highly proficient in using “keyboard” (from 57% to 64%) in MS2. For ID students in MS2, less than 28% of them rated themselves as proficient or highly proficient in using “digital camera” (27%), “keyboard” (20%) and “printer” (12%). Over 65% of them rated themselves as not proficient or knew nothing about all listed types of hardware (66%-82%).

Table 8.2 Students' self-evaluated levels of proficiency in software use ([E6-1]SQ15a-k, [E6-2/E6-3]SQ16a-k, [E6-4/E6-5/E6-6] SQ18a-k)

Special school types	Soft-ware	MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all	
Normal curriculum (NC)	a.	3.23	1.27	81	15	(19)	19	(23)	29	(36)	6	(7)	12	(15)	3.26	1.28	159	33	(21)	39	(25)	41	(26)	28	(18)	18	(11)	0.863
	b.	2.58	1.33	81	8	(10)	12	(15)	24	(30)	12	(15)	25	(31)	2.75	1.32	158	16	(10)	32	(20)	50	(32)	17	(11)	43	(27)	0.331
	c.	2.41	1.42	81	7	(9)	14	(17)	20	(25)	4	(5)	36	(44)	2.89	1.41	159	23	(14)	39	(25)	37	(23)	18	(11)	42	(26)	0.078
	d.	3.20	1.38	81	18	(22)	17	(21)	24	(30)	7	(9)	15	(19)	3.14	1.41	159	36	(23)	33	(21)	36	(23)	25	(16)	29	(18)	0.918
	e.	3.44	1.34	81	22	(27)	20	(25)	23	(28)	4	(5)	12	(15)	3.18	1.33	158	31	(20)	39	(25)	38	(24)	27	(17)	23	(15)	0.321
	f.	2.12	1.27	81	5	(6)	6	(7)	22	(27)	9	(11)	39	(48)	2.59	1.43	159	20	(13)	29	(18)	30	(19)	26	(16)	54	(34)	0.156
	g.	2.48	1.42	81	9	(11)	11	(14)	23	(28)	5	(6)	33	(41)	2.63	1.42	159	21	(13)	27	(17)	33	(21)	28	(18)	50	(31)	0.968
	h.	2.02	1.35	81	6	(7)	7	(9)	17	(21)	4	(5)	47	(58)	2.39	1.44	159	21	(13)	17	(11)	29	(18)	28	(18)	64	(40)	0.510
	i.	1.99	1.29	81	6	(7)	5	(6)	15	(19)	11	(14)	44	(54)	2.33	1.38	158	18	(11)	16	(10)	29	(18)	32	(20)	63	(40)	0.683
	j.	2.43	1.40	81	7	(9)	16	(20)	14	(17)	12	(15)	32	(40)	2.47	1.42	157	20	(13)	19	(12)	34	(22)	26	(17)	58	(37)	0.724
	k.	3.27	1.38	81	19	(23)	19	(23)	22	(27)	7	(9)	14	(17)	3.53	1.31	158	47	(30)	40	(25)	36	(23)	19	(12)	16	(10)	0.069
Intellectual Disabilities (ID) curriculum	a.	1.86	1.21	118	9	(8)	4	(3)	12	(10)	29	(25)	64	(54)	1.62	0.99	60	1	(2)	3	(5)	7	(12)	10	(17)	39	(65)	---
	b.	1.63	1.13	118	7	(6)	2	(2)	11	(9)	18	(15)	81	(68)	1.53	1.14	60	3	(5)	2	(3)	7	(12)	0	(0)	48	(80)	---
	c.	1.95	1.27	118	10	(9)	5	(4)	15	(13)	26	(22)	62	(52)	1.83	1.18	60	3	(5)	3	(5)	10	(17)	9	(15)	35	(58)	---
	d.	1.86	1.39	118	13	(11)	7	(6)	8	(7)	13	(11)	77	(65)	1.92	1.43	60	7	(12)	3	(5)	7	(12)	4	(7)	39	(65)	---
	e.	1.79	1.24	118	9	(7)	4	(3)	18	(15)	12	(10)	76	(64)	2.28	1.22	60	5	(8)	7	(12)	4	(7)	28	(47)	16	(27)	---
	f.	1.63	1.18	118	6	(5)	9	(7)	8	(7)	9	(8)	87	(73)	1.48	0.98	60	2	(3)	1	(2)	6	(10)	6	(10)	45	(75)	---
	g.	1.69	1.26	118	9	(8)	4	(3)	12	(10)	8	(7)	85	(72)	1.87	0.89	60	1	(2)	3	(5)	5	(8)	29	(48)	22	(37)	---
	h.	1.53	1.09	118	6	(5)	4	(3)	9	(7)	10	(9)	90	(76)	1.53	1.11	60	2	(3)	4	(7)	5	(8)	2	(3)	47	(78)	---
	i.	1.42	1.05	118	6	(5)	4	(3)	5	(4)	6	(5)	98	(83)	1.25	0.68	60	0	(0)	1	(2)	5	(8)	2	(3)	52	(87)	---
	j.	1.49	1.06	118	6	(5)	2	(2)	7	(6)	13	(11)	90	(76)	1.47	0.89	60	0	(0)	4	(7)	4	(7)	8	(13)	44	(73)	---
	k.	1.79	1.26	118	8	(7)	7	(6)	11	(10)	16	(13)	76	(64)	1.88	1.32	60	5	(8)	5	(8)	3	(5)	12	(20)	35	(58)	---

Software

a. Word processing software
b. Spreadsheet
c. Presentation software
d. Online communication software (e.g. E-mail)
e. Online information searching tools (e.g. browser, search engine)
f. Web design/editing software
g. Computer graphic design (e.g. drawing and photo editing)
h. Multi-media design software (e.g. animation design)
i. Programming (e.g. Logo and Java)
j. Audio/Video editing software (e.g. editing and file format conversion)
k. Chinese input

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.3 Students' self-evaluated levels of proficiency in hardware use ([E6-1]SQ16a-j, [E6-2/E6-3]SQ17a-j, [E6-4/E6-5/E6-6] SQ19a-j)

Special school types	Hard-ware	MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all	
NC	a.	3.14	1.42	81	16	(20)	21	(26)	20	(25)	6	(7)	18	(22)	3.04	1.35	158	25	(16)	41	(26)	39	(25)	22	(14)	31	(20)	0.884
	b.	3.02	1.35	81	11	(14)	24	(30)	19	(23)	10	(12)	17	(21)	2.98	1.50	158	35	(22)	29	(18)	33	(21)	20	(13)	41	(26)	0.786
	c.	2.88	1.47	81	14	(17)	16	(20)	21	(26)	6	(7)	24	(30)	2.74	1.46	157	25	(16)	28	(18)	32	(20)	25	(16)	47	(30)	0.682
	d.	2.49	1.52	81	11	(14)	13	(16)	17	(21)	4	(5)	36	(44)	2.48	1.45	157	19	(12)	24	(15)	34	(22)	17	(11)	63	(40)	0.947
	e.	2.43	1.36	81	6	(7)	14	(17)	21	(26)	8	(10)	32	(40)	2.46	1.39	158	20	(13)	17	(11)	35	(22)	30	(19)	56	(35)	0.818
	f.	2.21	1.39	81	8	(10)	6	(7)	22	(27)	4	(5)	41	(51)	2.33	1.45	157	21	(13)	14	(9)	30	(19)	23	(15)	69	(44)	0.649
	g.	2.37	1.46	81	9	(11)	12	(15)	16	(20)	7	(9)	37	(46)	2.52	1.52	158	25	(16)	23	(15)	24	(15)	23	(15)	63	(40)	0.751
	h.	2.59	1.55	81	15	(19)	9	(11)	17	(21)	8	(10)	32	(40)	2.75	1.51	158	28	(18)	29	(18)	27	(17)	23	(15)	51	(32)	0.477
	i.	2.65	1.51	81	13	(16)	11	(14)	24	(30)	1	(1)	32	(40)	2.59	1.50	158	27	(17)	20	(13)	29	(18)	25	(16)	57	(36)	0.936
	j.	3.47	1.27	81	18	(22)	28	(35)	19	(23)	6	(7)	10	(12)	3.82	1.18	157	58	(37)	43	(27)	32	(20)	17	(11)	7	(4)	0.005**
ID	a.	1.89	1.23	119	8	(6)	9	(7)	11	(9)	26	(22)	65	(55)	1.88	1.04	60	1	(2)	6	(10)	5	(8)	21	(35)	27	(45)	---
	b.	1.77	1.19	119	9	(7)	4	(3)	10	(9)	26	(22)	70	(59)	1.97	1.13	60	3	(5)	5	(8)	4	(7)	23	(38)	25	(42)	---
	c.	1.73	1.20	119	4	(3)	15	(12)	7	(6)	15	(12)	79	(67)	2.23	1.33	60	4	(7)	12	(20)	1	(2)	20	(33)	23	(38)	---
	d.	1.52	1.05	119	3	(2)	9	(8)	5	(4)	12	(10)	90	(75)	1.85	1.02	60	1	(2)	5	(8)	6	(10)	20	(33)	28	(47)	---
	e.	1.45	1.02	119	2	(2)	10	(9)	4	(4)	6	(5)	97	(81)	1.80	0.88	60	1	(2)	1	(2)	9	(15)	23	(38)	26	(43)	---
	f.	1.36	0.99	119	5	(4)	4	(3)	5	(4)	4	(3)	102	(86)	1.90	1.16	60	4	(7)	3	(5)	4	(7)	21	(35)	28	(47)	---
	g.	1.47	1.13	119	7	(6)	5	(4)	3	(2)	7	(6)	97	(81)	1.85	1.22	60	3	(5)	5	(8)	7	(12)	10	(17)	35	(58)	---
	h.	1.64	1.25	119	9	(7)	8	(6)	4	(3)	11	(9)	88	(74)	1.92	1.21	60	4	(7)	4	(7)	5	(8)	17	(28)	30	(50)	---
	i.	1.61	1.20	119	8	(7)	5	(4)	7	(6)	11	(9)	88	(74)	1.92	1.15	60	2	(3)	6	(10)	7	(12)	15	(25)	30	(50)	---
	j.	1.91	1.41	119	14	(12)	6	(5)	10	(8)	14	(12)	75	(63)	2.32	1.33	60	7	(12)	5	(8)	8	(13)	20	(33)	20	(33)	---

Hardware
a. Printer
b. CD-ROM (CD-R or DVD-R) Writer
c. Digital Camera
d. Digital Video Recorder
e. Scanner
f. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)]
g. Network Devices (e.g. Domestic Network Devices)
h. Portable Computer Game Devices
i. Portable Multi-media Player Devices
j. Use of Keyboard
Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.1.2 Attitude towards Social and Ethical Issues of Using IT

School heads were quite satisfied (一般) with students' attitude towards social and ethical issues of using IT

Regarding students' attitude towards social and ethical issues of using IT, 34% of school heads in MS1 were satisfied or very satisfied that students agreed that the use of IT should comply with ethical and moral standard as set out in society. No statistically significant difference was observed in MS2 (Table 8.4, [E1-1/E1-2]HSQ1g).

Table 8.4 School heads' levels of satisfaction with students' attitude towards social and ethical issues of using IT ([E1-1/E1-2]HSQ1g)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students agree that the use of IT should comply with ethical and moral standard as set out in society."									
MS1	3.11	0.90	54	2 (4)	16 (30)	25 (46)	8 (15)	3 (6)	0.550
MS2	3.02	0.78	52	0 (0)	14 (27)	27 (52)	9 (17)	2 (4)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students generally showed awareness of social and ethical issues of using IT

The appropriateness of students' attitude towards using IT can be measured by students' views towards the social and ethical issues in various computer-related activities. Students generally showed themselves as responsible users of IT. The responses, shown in Table 8.5 ([E6-1]SQ19a-f, [E6-2/E6-3]SQ20a-f, [E6-4/E6-5/E6-6]SQ22a-f), illustrate that there is a reasonable level of awareness of social and ethical issues relating to the use of IT. In MS1, more than 64% of the surveyed students showed positive attitude towards the following social and ethical issues in using IT: "avoid spending long hours on computer or online games" (rated as agreed or strongly agreed by 68% of NC and 79% of ID) and "beware of e-mail bombs or the spread of computer virus" (rated as agreed or strongly agreed by 67% of NC and 65% of ID). The mean ratings fell in the range of 3.65-3.81 (SD:1.05-1.13) for NC and 3.64-3.94 (SD:0.99-1.11) for ID students on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. More than 52% of the respondents disagreed or strongly disagreed on improper social and ethical activities related to the use of IT: "disclosing personal particulars to strangers online" (70% of NC and 64% of ID), "surfing pornographic websites (66% of NC and 69% of ID) and "using pirated software" (53% of NC and 63% of ID). The mean ratings fell in the range of 2.09-2.43 (SD:1.06-1.17) for NC and 2.10-2.26 (SD:1.25-1.29) for ID students on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. On the other hand, 47% of NC and 43% of ID students disagreed or strongly disagreed on "sending or forwarding unnecessary e-mails or messages" with mean ratings of 2.74 (SD:1.25) and 2.90 (SD:1.37) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 8.5, [E6-1]SQ19a-f, [E6-2/E6-3]SQ20a-f, [E6-4/E6-5/E6-6]SQ22a-f).

No statistically significant difference was noted for the NC students in MS2. For ID students in MS2, 60% and 67% of them respectively agreed or strongly agreed to "avoid spending long hours on computer or online games" and "beware of e-mail bombs or the spread of computer virus". 45% to 60% of ID students disagreed or strongly disagreed on "sending or forwarding unnecessary e-mails or messages" (45%), "surfing pornographic websites" (45%), "using pirated software" (50%) and "disclosing personal particulars to strangers online" (60%).

Table 8.5 Students' levels of agreement to the social and ethical issues related to the use of IT ([E6-1]SQ19a-f, [E6-2/E6-3]SQ20a-f, [E6-4/E6-5/E6-6]SQ22a-f)

Special school types		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Strongly agree		Agree		Neutral		Disagree		Strongly disagree										
NC	a.	3.65	1.05	81	13	(16)	42	(52)	18	(22)	1	(1)	7	(9)	3.70	1.10	156	45	(29)	44	(28)	49	(31)	11	(7)	7	(4)	0.637
	b.	3.81	1.13	81	26	(32)	28	(35)	18	(22)	4	(5)	5	(6)	3.92	1.06	158	59	(37)	47	(30)	35	(22)	14	(9)	3	(2)	0.252
	c.	2.74	1.25	81	10	(12)	11	(14)	22	(27)	24	(30)	14	(17)	2.95	1.41	159	32	(20)	22	(14)	47	(30)	22	(14)	36	(23)	0.621
	d.	2.12	1.10	81	4	(5)	3	(4)	21	(26)	24	(30)	29	(36)	2.46	1.37	159	20	(13)	12	(8)	45	(28)	26	(16)	56	(35)	0.748
	e.	2.43	1.17	81	6	(7)	6	(7)	26	(32)	22	(27)	21	(26)	2.55	1.43	158	25	(16)	12	(8)	43	(27)	23	(15)	55	(35)	0.904
	f.	2.09	1.06	81	4	(5)	2	(2)	19	(23)	28	(35)	28	(35)	2.39	1.37	156	19	(12)	12	(8)	38	(24)	29	(19)	58	(37)	0.578
ID	a.	3.94	0.99	87	25	(29)	44	(50)	10	(11)	6	(7)	3	(4)	3.59	1.34	27	8	(30)	8	(30)	7	(26)	0	(0)	4	(15)	---
	b.	3.64	1.11	85	19	(22)	36	(43)	15	(17)	11	(13)	4	(5)	3.76	1.00	21	5	(24)	9	(43)	4	(19)	3	(14)	0	(0)	---
	c.	2.90	1.37	80	9	(12)	25	(31)	12	(14)	17	(21)	17	(22)	3.10	1.37	20	4	(20)	5	(25)	2	(10)	7	(35)	2	(10)	---
	d.	2.10	1.25	84	6	(7)	8	(9)	13	(15)	22	(26)	36	(43)	2.95	1.43	22	4	(18)	5	(23)	3	(14)	6	(27)	4	(18)	---
	e.	2.26	1.29	86	5	(5)	15	(17)	12	(13)	22	(25)	33	(38)	2.95	1.50	20	4	(20)	5	(25)	1	(5)	6	(30)	4	(20)	---
	f.	2.21	1.27	84	3	(3)	17	(20)	11	(13)	19	(23)	35	(41)	2.65	1.57	20	4	(20)	3	(15)	1	(5)	6	(30)	6	(30)	---

Social and ethical issues related to the use of IT

a. Avoid spending long hours on computer/online games
b. Beware of E-mail bombs or the spread of computer virus
c. Sending/forwarding unnecessary E-mails/messages
d. Surfing pornographic websites
e. Using pirated (reproduced) software
f. Disclosing personal particulars to strangers online

Mean: 1="Strongly disagree" and 5= "Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.1.3 Belief and Attitude towards Use of IT for Learning

School heads were satisfied with students' positive attitude towards using IT for learning

83% of school heads were satisfied or very satisfied that students possessed positive attitude towards using IT in their learning in MS1. No statistically significant difference was observed in MS2 (Table 8.6, [E1-1/E1-2]HSQ1b).

Table 8.6 School heads' levels of satisfaction with students' belief and attitude towards the use of IT for learning (E1-1/E1-2]HSQ1b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Students possess positive attitude towards using IT in their learning."									
MS1	3.94	0.53	54	6 (11)	39 (72)	9 (17)	0 (0)	0 (0)	0.536
MS2	3.87	0.56	52	4 (8)	38 (73)	9 (17)	1 (2)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students, teachers/therapists and parents perceived that IT had positive impact on learning — a statistically significant increase was observed in the level of agreement on the positive impact of IT on learning outcomes for NC parents in MS2

Regarding the perceived impact of IT on students' learning outcomes, students, teachers and parents showed very positive perception of learning with IT. Students' levels of agreement on their learning outcome as derived from learning with IT is depicted in Table 8.7 ([E6-1]SQ14ai-ix, [E6-2]SQ15ai-ix, [E6-3]SQ15ai-x, [E6-4/E6-6]SQ17ai-xiv, [E6-5]SQ17ai-xv). There are vivid differences in students' view on the impact of IT in learning across 9 types of special schools. However, these figures should be interpreted with caution due to the small sample size. The Hospital School (H) students gave the highest mean ratings for enhancing "creativity" (4.00) in MS1 and "academic performance" (3.69) in MS2. The School for Social Development (SSD) students gave the same highest mean ratings (3.17) for enhancing "planning and learning management skills", "creativity" and "interest in self-learning of subject content", whereas the lowest mean rating was given to enhancing "communication and presentation skills" (2.83) in MS1. They gave the same highest ratings of 3.83 for enhancing "academic performance" and widening "perspective through more interaction with the outside world" in MS2. The School for Children with Visual Impairment (VI) students gave the highest rating for overcoming "the learning difficulties caused by impairment" (3.87) in MS1 and enhancing "information processing ability" (3.61) in MS2. The School for Children with Hearing Impairment (HI) students gave lower ratings on all items (between 2.78-3.33) except the one on strengthening "understanding of subject knowledge" (3.67) in MS1. The mean ratings increased (between 3.04-3.75) in MS2. The highest mean rating of 3.75 was given to enhancing "interest in self-learning of subject content". The School for Children with Physical Disability (PD) students gave higher mean ratings of 4.00 for enhancing "interest in self-learning of subject content" and providing "opportunities for collaborative learning" in MS1 while the same highest rating of 3.52 was given to strengthening the "understanding of subject knowledge" and enhancing "interest in self-learning of subject content" in MS2. The School for the Mildly Intellectually Disabled (ID-M) students rated highly on all the impacts, with all mean ratings (between 3.64-4.07) higher than the overall means (3.33-3.68) in MS1. The School for the Moderately Intellectually Disabled (ID-Mod) students gave the same highest rating (3.75) for enhancing "interest in self-learning of subject content", "information processing ability" and strengthening the "understanding of subject knowledge" in MS1. The same highest ratings of 4.00 were given to enhancing "academic performance", strengthening the "understanding of subject knowledge", overcoming "the learning difficulties caused by impairment" and enhancing "cognitive ability" in MS2. The School for the Mildly and Moderately Intellectually Disabled (ID-Mmod)

students gave higher ratings for enhancing "therapy/training performance" (3.88), "planning and learning management skills" (3.73) and "interest in self-learning of subject content" (3.70) in MS1. The highest mean rating of 4.00 was given to enhancing "creativity" in MS2. On the other hand, the lowest rating was recorded for enhancing "information processing ability" (2.96) in MS1 and "cognitive ability" (3.30) in MS2. The School for the Severely Intellectually Disabled (ID-S) students gave the same highest rating of 3.90 for strengthening "understanding of subject knowledge", widening "perspective through more interaction with the outside world" and overcoming "the learning difficulties caused by impairment" in MS1. The same highest rating of 4.14 was given for enhancing "cognitive ability" and widening "perspective through more interaction with the outside world" in MS2. On the other hand, they gave lower ratings for enhancing "academic performance" (1.50), "planning and learning management skills" (1.40), "information processing ability" (1.40) and "creativity" (1.30) in MS1. The same lowest ratings of 3.00 were given to enhancing "therapy/training performance" and "interest in therapy/training" as well as strengthening "understanding of therapy/training content" in MS2.

Teachers' perception of the impacts on students' learning with IT were different across different types of special schools (Table 8.8a, [E5]TQ15a-i). In MS1, H, SSD, HI, ID-M and ID-S teachers in MS1 as well as VI and ID-S in MS2 gave the highest mean rating for widening "perspective through more interaction with the outside world" (H=MS1: 3.98; SSD=MS1: 4.11; VI=MS2: 3.72; HI=MS1: 4.33; ID-M=MS1: 3.85; ID-S=MS1: 4.00, MS2: 3.60). VI teachers in MS1 and SSD in MS2 gave the highest mean rating for enhancing "information processing ability" (VI=MS1: 3.86; SSD=MS2: 3.87) in MS1. PD and ID-Mmod teachers in MS1 as well as H, VI, HI, ID-Mmod, PD in MS2 gave the highest mean rating for enhancing "self-learning and interest in learning subject content" (H=MS2: 3.84; VI=MS2: 3.72; HI=MS2: 4.00; ID-Mmod=MS1: 3.91, MS2: 3.90; PD=MS1: 4.17 MS2: 3.88). ID-Mod teachers gave higher mean ratings for strengthening "understanding of the subject content" (3.89) as well as enhancing "self-learning and interest in learning subject content" (3.89) in MS1 and enhancing "cognitive ability" (4.00) in MS2. Again these figures must be interpreted with caution due to the small sample size. (Table 8.8a, [E5]TQ15a-i).

As for therapists, SPH therapists in MS1 gave mean ratings lower than 3.00 for all impacts on students' therapy/training with IT except for enhancing "planning and therapy or training management skills" (3.00) and widening "perspective through more interaction with the outside world" (3.09). The lowest mean rating of 2.55 was given to reducing "the learning difficulties caused by impairment". In MS2, the mean ratings for SPH therapists ranged from 3.11 to 3.98 (SD:0.44-1.01). The same highest rating of 3.89 was given to widening "perspective through more interaction with the outside world" and reducing "the learning difficulties caused by impairment". The lowest mean rating of 3.11 was given to enhancing "creativity". The PHY therapists gave all impacts a mean rating of 3.00 or higher in MS1. "Enhance self-learning and interest in therapy or training" and "widen perspective through more interaction with outside world" were the two impacts that had the same highest mean rating of 3.67 whereas "enhance creativity" was the impact with the lowest mean rating of 3.00. In MS2, the mean ratings for PHY therapists ranged from 2.57 to 3.57 (SD:0.53-0.98). The top two ratings were given to widening "perspective through more interaction with the outside world" (3.57) and enhancing "cognitive ability" (3.43). The lowest mean rating was given to enhancing "planning and therapy/training management skills" (2.57). OC therapists gave all impacts a mean rating of 3.00 or higher with reducing "the learning difficulties caused by impairment" having the highest mean rating of 4.00 while strengthening "the understanding of the therapy or training content" having the lowest mean rating of 3.00 on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. In MS2, the mean ratings for OC therapists ranged from 3.18 to 3.82 (SD: 0.50-1.04). The same highest rating of 3.82 was given to widening "perspective through more interaction with the

outside world", enhancing "cognitive ability" and reducing "the learning difficulties caused by impairment". The lowest mean rating was given to the same item in MS1 and MS2. (Table 8.8b, [E8]THQ14a-k).

Table 8.9 ([E7-1/E7-2]PQ5a-f) presents the parents' belief of the impact of IT on students' learning outcomes. 38%-66% of ID parents in MS1 and 39%-62% in MS2 agreed or strongly agreed that learning IT could: provide rich learning resources for their children's learning (MS1: 66%, MS2: 62%), enhance their interest in self-learning of subject matter (MS1: 62%, MS2: 52%), widen children's perspective through more interaction with the outside world (MS1: 56%, MS2: 56%), enhance their academic performance (MS1: 56%, MS2: 46%), enhance therapy/training effectiveness (MS1=MS2: 51%), enhance self-learning and interest in therapy/training effectiveness (MS1: 48%, MS2: 51%), provide collaborative learning opportunities for the children (MS1: 43%, MS2: 43%) and enhance their communication and presentation skills (MS1: 38%, MS2: 39%). In MS1, ID parents had a higher level of agreement than that of NC parents in believing that learning with the use of IT could provide a positive learning outcome to their children. Only 6% to 33% of NC parents agreed or strongly agreed the aforementioned learning outcomes, with mean ratings below 2.85 on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. In MS2, 38%-63% of NC parents agreed or strongly agreed the aforementioned learning outcomes. 61% and 63% of them respectively agreed or strongly agreed with the outcomes of providing rich learning resources to their children for learning and enhancing their children's interest in self-learning of subject matter. On the other hand, 38% of them agreed or strongly agreed with the outcome of enhancing their children therapy/training effectiveness.

Table 8.7 Students' levels of agreement to their learning outcomes as derived from learning with IT ([E6-1]SQ14ai-ix, [E6-2] SQ15ai-ix, [E6-3]SQ15ai-x, [E6-4/E6-6]SQ17ai-xiv, [E6-5]SQ17ai-xv)

Learning outcomes	MS1 Overall				H			SSD			VI			HI			ID-M			ID-Mmod			ID-Mod			ID-S			PD		
	Mean	SD	%	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
i.	3.46	1.07	57	175	3.30	0.48	10	3.08	1.28	24	3.74	0.73	31	3.33	0.50	9	4.07	0.58	45	3.19	1.20	26	3.67	0.49	12	1.50	1.08	10	3.38	1.30	8
ii.	3.66	0.94	65	174	3.70	0.67	10	3.04	1.23	24	3.55	0.62	31	3.67	0.50	9	4.00	0.91	44	3.65	1.23	26	3.75	0.45	12	3.90	0.32	10	3.63	1.06	8
iii.	3.68	0.90	65	173	3.80	0.79	10	3.17	1.31	24	3.52	0.85	31	3.22	0.67	9	4.02	0.78	42	3.70	0.87	27	3.75	0.45	12	3.80	0.42	10	4.00	0.76	8
iv.	3.33	1.06	45	173	3.20	0.63	10	3.17	1.27	24	3.06	0.68	31	2.78	0.44	9	3.88	0.96	43	3.73	0.92	26	3.50	0.52	12	1.40	0.84	10	3.50	0.93	8
v.	3.68	0.86	63	101	-	-	-	-	-	-	-	-	-	2.78	0.44	9	3.89	0.89	36	3.88	0.86	26	3.17	0.58	12	3.80	0.42	10	3.75	1.04	8
vi.	3.46	0.84	49	101	-	-	-	-	-	-	-	-	-	2.78	0.44	9	3.67	0.93	36	3.62	0.90	26	3.33	0.65	12	3.00	0.00	10	3.50	0.93	8
vii.	3.46	0.93	49	102	-	-	-	-	-	-	-	-	-	2.78	0.44	9	3.64	1.13	36	3.67	0.92	27	3.33	0.65	12	3.10	0.32	10	3.38	0.92	8
viii.	3.51	0.95	49	107	-	-	-	-	-	-	-	-	-	2.78	0.44	9	3.92	1.04	39	3.67	0.92	27	3.17	0.58	12	2.91	0.29	12	3.25	1.04	8
ix	3.34	1.09	53	175	3.30	0.67	10	3.13	1.26	24	3.74	0.77	31	3.11	0.60	9	3.81	0.89	42	2.96	1.13	27	3.75	0.45	12	1.40	0.84	12	3.38	1.19	8
x.	3.34	1.12	49	176	4.00	0.82	10	3.17	1.24	24	3.58	0.99	31	2.78	0.44	9	3.66	0.99	44	3.16	1.11	25	3.69	0.63	13	1.30	0.95	12	3.38	0.92	8
xi.	3.43	1.00	50	174	3.50	0.53	10	2.83	1.27	24	3.65	0.84	31	2.78	0.44	9	3.93	0.95	42	3.12	1.21	26	3.42	0.67	12	3.20	0.42	12	3.63	0.74	8
xii.	3.42	0.95	47	177	3.30	0.67	10	3.00	1.22	24	3.55	0.81	31	2.78	0.44	9	3.87	0.87	45	3.12	1.14	26	3.33	0.65	12	3.10	0.32	12	4.00	0.76	8
xiii	3.56	0.99	58	180	3.80	0.92	10	2.96	1.33	24	3.71	0.90	31	3.00	0.50	9	3.86	0.82	44	3.29	1.21	28	3.64	0.50	14	3.90	0.32	12	3.75	0.89	8
xiv	3.58	0.96	57	142	-	-	-	-	-	-	3.87	0.88	31	2.78	0.44	9	3.64	1.05	45	3.28	1.17	25	3.58	0.51	12	3.90	0.32	12	3.50	0.93	8
xv	3.54	0.96	61	93	-	-	-	-	-	-	-	-	-	-	-	-	3.64	0.88	42	3.22	1.28	27	3.67	0.49	12	3.80	0.63	12	-	-	-

Learning outcomes	MS2 Overall				H			SSD			VI			HI			ID-M			ID-Mmod			ID-Mod			ID-S			PD		
	Mean	SD	%	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
i.	3.63	0.89	62	212	3.69	0.70	16	3.83	1.08	54	3.31	0.86	36	3.54	0.51	24	-	-	- -	3.50	1.24	20	4.00	0.00	26	4.00	0.00	14	3.34	0.94	29
ii.	3.66	0.91	65	209	3.56	0.96	16	3.74	1.10	54	3.50	0.88	36	3.58	0.58	24	-	-	- -	3.58	1.26	19	4.00	0.00	26	4.00	0.00	5	3.52	0.91	29
iii.	3.54	0.96	56	211	3.63	0.96	16	3.78	1.04	54	3.36	0.96	36	3.75	0.61	24	-	-	- -	3.70	1.30	20	2.81	0.57	26	4.00	0.00	6	3.52	0.87	29
iv.	3.36	0.99	47	211	3.13	0.81	16	3.70	1.08	54	3.25	0.87	36	3.46	0.88	24	-	-	- -	3.60	1.23	20	2.77	0.51	26	3.83	0.98	6	3.17	1.04	29
v.	3.33	1.01	52	105	-	-	-	-	-	-	-	-	-	3.29	1.08	24	-	-	- -	3.50	1.24	20	3.88	0.33	26	3.00	0.89	6	2.83	0.97	29
vi.	3.26	1.05	53	105	-	-	-	-	-	-	-	-	-	3.08	1.10	24	-	-	- -	3.50	1.24	20	3.92	0.27	26	3.00	0.89	6	2.69	1.00	29
vii.	3.27	0.98	52	105	-	-	-	-	-	-	-	-	-	3.21	0.83	24	-	-	- -	3.60	1.23	20	3.58	0.64	26	3.00	0.89	6	2.86	1.06	29
viii.	3.05	0.96	30	105	-	-	-	-	-	-	-	-	-	3.04	0.86	24	-	-	- -	3.60	1.31	20	2.73	0.45	26	3.50	0.84	6	2.86	0.99	29
ix	3.45	0.91	48	211	3.25	0.77	16	3.76	1.06	54	3.61	0.73	36	3.38	0.77	24	-	-	- -	3.95	0.69	20	2.77	0.51	26	3.50	0.84	6	3.07	0.96	29
x.	3.39	0.98	45	212	3.44	0.81	16	3.72	1.04	54	3.31	0.95	36	3.13	1.12	24	-	-	- -	4.00	0.73	20	2.85	0.54	26	3.71	0.76	7	3.03	0.98	29
xi.	3.48	0.97	54	212	3.06	0.77	16	3.72	1.05	54	3.00	1.01	36	3.38	1.13	24	-	-	- -	3.90	0.79	20	3.85	0.46	26	3.86	0.38	7	3.24	0.91	29
xii.	3.42	1.00	49	211	2.88	0.89	16	3.65	1.10	54	3.53	0.91	36	3.33	0.96	24	-	-	- -	3.42	1.39	19	3.19	0.69	26	4.00	4.00	7	3.31	0.97	29
xiii	3.61	0.95	60	212	3.31	0.87	16	3.83	1.09	54	3.50	0.91	36	3.63	0.97	24	-	-	- -	3.55	1.00	20	3.77	0.43	26	4.14	0.38	7	3.24	1.02	29
xiv	3.53	0.82	60	141	-	-	-	-	-	-	3.36	0.93	36	3.63	0.97	24	-	-	- -	3.50	0.89	20	4.00	0.00	26	3.67	0.52	6	3.28	0.88	29
xv	3.75	0.78	81	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	- -	3.30	1.13	20	4.00	0.00	26	4.14	0.38	7	-	-	-

Learning Outcomes derived from their learning with IT

i. Enhance academic performance
ii. Strengthen understanding of subject knowledge
iii. Enhance interest in self-learning of subject content
iv. Enhance planning and learning management skills
v. Enhance therapy/training performance
vi. Strengthen understanding of therapy/training content
vii. Enhance interest in therapy/training
viii. Enhance planning and therapy/training management skills
ix. Enhance information processing ability
x. Enhance creativity
xi. Enhance communication and presentation skills
xii. Provide opportunities for collaborative learning
xiii. Widen perspective through more interaction with the outside world
xiv. Overcome the learning difficulties caused by impairment
xv. Enhance cognitive ability (e.g. powers of concentration and understanding)

%= percentage of choosing options 'Strongly agree' or 'Agree'; Mean (1-5), 1= "Strongly disagree", 5="Strongly agree"; N= Total number of Student;

Table 8.8a Teachers' levels of agreement to students' learning outcomes as derived from learning with IT ([E5]TQ15a-k)

	MS1 Overall (N=191)			H (N=51)		SSD (N=18)		VI (N=22)		HI (N=6)		ID-M (N=26)		ID-Mmod (N=34)		ID-Mod (N=15)		ID-S (N=13)		PD (N=6)	
	Mean	**SD**	**%**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
a.	3.36	0.69	42	3.33	0.62	3.28	0.67	3.32	0.84	3.00	0.63	3.35	0.75	3.50	0.66	3.20	0.77	3.54	0.66	3.50	0.55
b.	3.75	0.59	73	3.86	0.45	3.72	0.46	3.64	0.66	3.50	0.55	3.69	0.74	3.76	0.55	3.67	0.62	3.69	0.63	4.00	1.10
c.	3.83	0.56	76	3.88	0.43	3.78	0.43	3.77	0.75	4.00	0.00	3.65	0.56	3.91	0.62	3.67	0.62	3.85	0.55	4.17	0.75
d.	3.40	0.70	45	3.39	0.57	3.72	0.57	3.68	0.78	3.00	0.63	3.00	0.75	3.44	0.75	3.27	0.80	3.54	0.66	3.50	0.55
e.	3.64	0.66	63	3.73	0.57	3.78	0.55	3.86	0.71	3.67	0.82	3.42	0.58	3.62	0.74	3.47	0.74	3.31	0.85	4.00	0.00
f.	3.37	0.76	43	3.22	0.78	3.67	0.77	3.64	0.79	3.17	0.75	3.23	0.76	3.29	0.76	3.27	0.70	3.69	0.63	3.50	0.55
g.	3.34	0.77	43	3.14	0.80	3.17	0.62	3.41	0.91	3.67	0.52	3.27	0.78	3.53	0.66	3.13	0.92	3.92	0.49	3.33	0.52
h.	3.37	0.73	46	3.25	0.69	3.39	0.61	3.59	0.80	3.83	0.41	3.04	0.87	3.47	0.61	3.00	0.76	3.85	0.55	3.67	0.82
i.	3.91	0.67	78	3.98	0.65	4.11	0.83	3.82	0.73	4.33	0.52	3.85	0.54	3.85	0.61	3.53	0.92	4.00	0.58	3.83	0.41
j.	3.58	0.74	58	3.69	0.65	3.33	0.59	3.55	0.91	3.83	0.75	3.54	0.76	3.62	0.74	3.33	0.72	3.77	0.60	3.33	1.21
k.	3.62	0.70	63	3.51	0.70	3.61	0.70	3.45	0.80	3.67	0.52	3.62	0.75	3.85	0.61	3.47	0.74	3.92	0.49	3.67	0.82

	MS2 Overall (N=195)			H (N=51)		SSD (N=15)		VI (N=18)		HI (N=19)		ID-M (N=0)		ID-Mmod (N=40)		ID-Mod (N=9)		ID-S (N=10)		PD (N=33)	
	Mean	**SD**	**%**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
a.	3.38	0.72	42	3.20	0.63	3.80	0.68	3.11	0.76	3.42	0.69	-	-	3.55	0.71	3.44	0.53	3.10	0.74	3.45	0.79
b.	3.69	0.64	66	3.65	0.52	3.87	0.52	3.33	0.69	3.89	0.57	-	-	3.78	0.62	3.89	0.33	3.40	0.70	3.70	0.85
c.	3.83	0.64	75	3.84	0.46	3.80	0.56	3.72	0.75	4.00	0.47	-	-	3.90	0.67	3.89	0.60	3.20	0.79	3.88	0.78
d.	3.37	0.76	43	3.25	0.69	3.47	0.83	3.22	0.94	3.37	0.76	-	-	3.50	0.78	3.56	0.53	3.10	0.74	3.45	0.75
e.	3.67	0.68	64	3.73	0.57	3.87	0.52	3.61	0.78	3.63	0.60	-	-	3.65	0.77	3.78	0.44	3.10	0.74	3.70	0.77
f.	3.33	0.74	37	3.27	0.60	3.53	0.92	3.00	0.77	3.47	0.70	-	-	3.35	0.83	3.33	0.50	3.30	0.67	3.42	0.83
g.	3.34	0.81	45	3.14	0.78	3.60	0.74	3.00	0.77	3.42	0.77	-	-	3.55	0.75	3.33	0.71	3.30	0.82	3.42	0.97
h.	3.37	0.80	45	3.29	0.70	3.60	0.99	3.06	1.00	3.42	0.69	-	-	3.50	0.72	3.22	0.67	3.30	0.82	3.42	0.94
i.	3.78	0.66	71	3.76	0.62	3.73	0.80	3.72	0.67	3.89	0.46	-	-	3.83	0.71	3.67	0.50	3.60	0.70	3.82	0.77
j.	3.59	0.76	60	3.63	0.72	3.47	0.83	3.39	0.78	3.63	0.68	-	-	3.63	0.81	3.56	0.73	3.50	0.71	3.70	0.81
k.	3.62	0.70	62	3.51	0.64	3.67	0.72	3.28	0.83	3.68	0.58	-	-	3.80	0.69	4.00	0.00	3.60	0.70	3.58	0.83

Students' learning outcomes as derived from their learning with IT

a. Enhance academic performance
b. Strengthen understanding of the subject content
c. Enhance self-learning and interest in learning the subject content
d. Enhance planning and learning management skills
e. Enhance information processing ability
f. Enhance creativity
g. Enhance communication and presentation skills
h. Provide opportunities for collaborative learning
i. Widen perspective through more interaction with the outside world
j. Overcome the learning difficulties caused by impairment
k. Enhance cognitive ability (e.g. powers of concentration and understanding)
%=percentage of choosing 'Strongly agree' or 'Agree'; Mean (1-5), 1="Strongly disagree" and 5="Strongly agree"; *N=Total number of teachers*;

Table 8.8b Therapists' levels of agreement to students' therapy/training outcomes as derived from therapy/training with IT ([E8]THQ14a-k)

Therapist types		MS1										MS2									
		Mean (1-5)	SD	N	Count (%) of Therapists choosing the option							Mean (1-5)	SD	N	Count (%) of Therapists choosing the option						
					Strongly agree		Agree		Neutral		Disagree		Strongly disagree			Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
Speech therapists (SPH)	a.	2.73	1.19	11	0	(0)	3	(27)	5	(45)	0	(0)	3	(27)	3.56	0.53	9	0	(0)	5	(56)	4	(44)	0	(0)	0	(0)
	b.	2.73	1.19	11	0	(0)	3	(27)	5	(45)	0	(0)	3	(27)	3.56	0.53	9	0	(0)	5	(56)	4	(44)	0	(0)	0	(0)
	c.	2.91	1.14	11	0	(0)	4	(36)	4	(36)	1	(9)	2	(18)	3.78	0.44	9	0	(0)	7	(78)	2	(22)	0	(0)	0	(0)
	d.	3.00	1.10	11	0	(0)	4	(36)	5	(45)	0	(0)	2	(18)	3.33	0.87	9	0	(0)	5	(56)	2	(22)	2	(22)	0	(0)
	e.	2.64	1.12	11	0	(0)	2	(18)	6	(55)	0	(0)	3	(27)	3.44	1.01	9	1	(11)	4	(44)	2	(22)	2	(22)	0	(0)
	f.	2.64	1.12	11	0	(0)	2	(18)	6	(55)	0	(0)	3	(27)	3.11	0.78	9	0	(0)	3	(33)	4	(44)	2	(22)	0	(0)
	g.	2.73	1.19	11	0	(0)	3	(27)	5	(45)	0	(0)	3	(27)	3.78	0.67	9	1	(11)	5	(56)	3	(33)	0	(0)	0	(0)
	h.	2.64	1.12	11	0	(0)	2	(18)	6	(55)	0	(0)	3	(27)	3.22	0.67	9	0	(0)	3	(33)	5	(56)	1	(11)	0	(0)
	i.	3.09	1.14	11	0	(0)	5	(45)	4	(36)	0	(0)	2	(18)	3.89	0.60	9	1	(11)	6	(67)	2	(22)	0	(0)	0	(0)
	j.	2.55	1.13	11	0	(0)	2	(18)	5	(45)	1	(9)	3	(27)	3.89	0.60	9	1	(11)	6	(67)	2	(22)	0	(0)	0	(0)
	k.	2.91	1.38	11	1	(9)	3	(27)	4	(36)	0	(0)	3	(27)	3.56	0.53	9	0	(0)	5	(56)	4	(44)	0	(0)	0	(0)
Physiotherapists (PHY)	a.	3.17	0.75	6	0	(0)	2	(33)	3	(50)	1	(17)	0	(0)	2.86	0.69	7	0	(0)	1	(14)	4	(57)	2	(29)	0	(0)
	b.	3.50	0.55	6	0	(0)	3	(50)	3	(50)	0	(0)	0	(0)	3.00	0.82	7	0	(0)	2	(29)	3	(43)	2	(29)	0	(0)
	c.	3.67	0.52	6	0	(0)	4	(67)	2	(33)	0	(0)	0	(0)	3.29	0.95	7	1	(14)	1	(14)	4	(57)	1	(14)	0	(0)
	d.	3.17	1.47	6	1	(17)	2	(33)	1	(17)	1	(17)	1	(17)	2.57	0.98	7	0	(0)	1	(14)	3	(43)	2	(29)	1	(14)
	e.	3.33	1.21	6	1	(17)	2	(33)	1	(17)	2	(33)	0	(0)	3.00	0.58	7	0	(0)	1	(14)	5	(71)	1	(14)	0	(0)
	f.	3.00	0.89	6	0	(0)	2	(33)	2	(33)	2	(33)	0	(0)	2.71	0.49	7	0	(0)	0	(0)	5	(71)	2	(29)	0	(0)
	g.	3.50	0.55	6	0	(0)	3	(50)	3	(50)	0	(0)	0	(0)	2.86	0.69	7	0	(0)	1	(14)	4	(57)	2	(29)	0	(0)
	h.	3.50	0.55	6	0	(0)	3	(50)	3	(50)	0	(0)	0	(0)	2.71	0.49	7	0	(0)	0	(0)	5	(71)	2	(29)	0	(0)
	i.	3.67	0.82	6	1	(17)	2	(33)	3	(50)	0	(0)	0	(0)	3.57	0.98	7	1	(14)	3	(43)	2	(29)	1	(14)	0	(0)
	j.	3.50	0.84	6	0	(0)	4	(67)	1	(17)	1	(17)	0	(0)	3.00	0.82	7	0	(0)	2	(29)	3	(43)	2	(29)	0	(0)
	k.	3.50	0.55	6	0	(0)	3	(50)	3	(50)	0	(0)	0	(0)	3.43	0.53	7	0	(0)	3	(43)	4	(57)	0	(0)	0	(0)
Occupational therapists (OC)	a.	3.57	0.53	7	0	(0)	4	(57)	3	(43)	0	(0)	0	(0)	3.45	0.93	11	0	(0)	7	(64)	3	(27)	0	(0)	1	(9)
	b.	3.00	0.58	7	0	(0)	1	(14)	5	(71)	1	(14)	0	(0)	3.18	0.87	11	0	(0)	4	(36)	6	(55)	0	(0)	1	(9)
	c.	3.86	0.38	7	0	(0)	6	(86)	1	(14)	0	(0)	0	(0)	3.64	0.50	11	0	(0)	7	(64)	4	(36)	0	(0)	0	(0)
	d.	3.57	0.79	7	0	(0)	5	(71)	1	(14)	1	(14)	0	(0)	3.45	1.04	11	1	(9)	5	(45)	4	(36)	0	(0)	1	(9)
	e.	3.71	0.49	7	0	(0)	5	(71)	2	(29)	0	(0)	0	(0)	3.45	0.69	11	0	(0)	6	(55)	4	(36)	1	(9)	0	(0)
	f.	3.29	0.49	7	0	(0)	2	(29)	5	(71)	0	(0)	0	(0)	3.45	0.93	11	0	(0)	7	(64)	3	(27)	0	(0)	1	(9)
	g.	3.43	0.53	7	0	(0)	3	(43)	4	(57)	0	(0)	0	(0)	3.55	0.69	11	1	(9)	4	(36)	6	(55)	0	(0)	0	(0)
	h.	3.29	0.76	7	0	(0)	3	(43)	3	(43)	1	(14)	0	(0)	3.55	0.69	11	0	(0)	7	(64)	3	(27)	1	(9)	0	(0)
	i.	3.86	0.38	7	0	(0)	6	(86)	1	(14)	0	(0)	0	(0)	3.82	0.75	11	2	(18)	5	(45)	4	(36)	0	(0)	0	(0)
	j.	4.00	0.58	7	1	(14)	5	(71)	1	(14)	0	(0)	0	(0)	3.82	0.60	11	1	(9)	7	(64)	3	(27)	0	(0)	0	(0)
	k.	3.71	0.95	7	1	(14)	4	(57)	1	(14)	1	(14)	0	(0)	3.82	0.60	11	1	(9)	7	(64)	3	(27)	0	(0)	0	(0)

Students' therapy/training outcomes as derived from therapy/training with IT

a. Enhance therapy/training effectiveness
b. Strengthen understanding of the therapy/training content
c. Enhance self-learning and interest in therapy/training
d .Enhance planning and therapy/training management skills
e. Enhance information processing ability
f. Enhance creativity
g. Enhance communication and presentation skills
h. Provide opportunities for collaborative learning
i. Widen perspective through more interaction with the outside world
j. Reduce the learning difficulties caused by impairment
k. Enhance cognitive ability (e.g. powers of concentration and understanding)

Mean: 1="Strongly disagree" and 5= "Strongly agree"

Table 8.9 Parents' levels of agreement on the learning outcomes as derived from students' learning with IT ([E7-1/E7-2]PQ5a-h)

	MS1 Overall								SSD			VI			HI			ID-M			ID-Mmod			ID-Mod			ID-S			PD		
	NC				ID																											
	Mean	SD	%	N	Mean	SD	%	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
a.	2.31	0.92	6	36	3.67	0.76	66	86	2.23	1.09	13	2.00	0.58	17	2.67	1.21	6	3.59	0.72	39	3.87	0.78	30	3.27	0.79	12	3.80	0.84	5	-	-	-
b.	2.47	0.86	9	34	3.49	0.66	56	87	2.62	1.12	13	2.08	0.49	15	2.83	0.75	6	3.59	0.60	40	3.33	0.76	30	3.64	0.50	12	3.60	0.55	5	-	-	-
c.	2.44	0.99	12	34	3.52	0.71	62	87	2.54	1.20	13	2.00	0.41	15	2.83	1.17	6	3.68	0.53	40	3.50	0.78	30	3.09	0.70	12	3.60	1.14	5	-	-	-
d.	2.83	1.17	33	6	3.29	0.85	51	87	2.62	1.26	13	2.15	0.55	14	2.83	1.17	6	3.30	0.85	40	3.13	0.97	30	3.45	0.52	12	3.60	0.55	5	-	-	-
e.	2.83	1.17	33	6	3.31	0.83	48	87	2.62	1.19	13	2.08	0.49	16	2.83	1.17	6	3.41	0.69	40	3.07	1.01	30	3.45	0.52	12	3.80	0.84	5	-	-	-
f.	2.45	0.90	9	33	3.20	0.87	38	86	2.31	1.32	13	2.08	0.49	16	2.67	0.52	6	3.27	0.87	39	3.10	0.92	30	3.09	0.70	12	3.60	0.89	5	-	-	-
g.	2.34	0.87	9	35	3.22	0.90	43	86	2.23	1.09	13	2.00	0.58	17	2.33	0.52	6	3.35	0.82	39	3.07	0.94	30	2.91	0.83	12	3.60	0.89	5	-	-	-
h.	2.20	0.96	12	35	3.43	0.89	56	86	2.62	1.12	13	2.08	0.49	15	2.33	1.03	6	3.51	0.93	40	3.17	0.91	30	3.82	0.40	11	3.80	0.84	5	-	-	-

	MS2 Overall								SSD			VI			HI			ID-M			ID-Mmod			ID-Mod			ID-S			PD		
	NC				ID																											
	Mean	SD	%	N	Mean	SD	%	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
a.	3.64	0.83	61	88	3.58	0.74	62	76	-	-	-	3.71	0.86	35	3.36	0.79	22	-	-	-	3.60	0.67	50	3.67	0.69	18	3.74	0.82	31	3.25	1.16	8
b.	3.45	0.69	50	88	3.36	0.81	46	76	-	-	-	3.54	0.70	35	3.32	0.72	22	-	-	-	3.40	0.78	50	3.17	0.71	18	3.45	0.68	31	3.50	1.20	8
c.	3.58	0.72	63	88	3.37	0.83	52	76	-	-	-	3.71	0.52	35	3.27	0.83	22	-	-	-	3.36	0.83	50	3.39	0.70	18	3.65	0.80	31	3.38	1.19	8
d.	3.28	0.82	38	53	3.32	0.84	51	76	-	-	-	3.60	0.55	35	3.23	0.81	22	-	-	-	3.26	0.72	50	3.61	0.78	18	3.32	0.83	31	3.00	1.41	8
e.	3.32	0.92	44	53	3.32	0.82	51	76	-	-	-	3.69	0.68	35	3.32	0.84	22	-	-	-	3.26	0.78	50	3.67	0.69	18	3.32	0.98	31	2.88	1.13	8
f.	3.51	0.73	55	88	3.17	0.84	39	76	-	-	-	3.74	0.82	35	3.23	0.87	22	-	-	-	3.12	0.80	50	3.28	0.75	18	3.61	0.76	31	3.25	1.28	8
g.	3.52	0.83	58	87	3.21	0.91	43	76	-	-	-	3.71	0.86	35	3.41	0.96	22	-	-	-	3.08	0.88	50	3.50	0.79	18	3.40	0.89	30	3.38	1.30	8
h.	3.53	0.87	59	88	3.33	0.91	56	76	-	-	-	3.54	0.70	35	3.27	0.83	22	-	-	-	3.30	0.91	50	3.56	0.78	18	3.48	0.93	31	3.00	1.20	8

Learning outcomes as derived from students' learning with IT

a. Provide rich learning resources to your child for learning
b. Enhance your child's academic performance
c. Enhance your child's interest in self-learning of subject matter
d. Enhance your child's therapy/training effectiveness
e. Enhance your child's self-learning and interest in therapy/training
f. Enhance your child's communication and presentation skills
g. Provide collaborative learning opportunities for your child
h. Widen your child's perspective through more interaction with the outside world

Mean: 1="Strongly disagree" and 5= "Strongly agree"; %= *percentage of choosing options 'Strongly agree' or 'agree'*

Students liked to use computers for learning

As far as the acceptance of using IT as a tool for learning was concerned, students liked to use computers for learning. 95% of NC students indicated that they liked using computers for learning in class in MS1. No statistically significant difference was observed in MS2. 96% and 92% of ID students respectively liked using computers for learning in class in MS1 and MS2 (Table 8.10, [E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ3a). In MS1, 81% NC students liked using computers for learning beyond school hours. No statistically significant difference was observed in MS2. Similarly, 79% and 82% of ID students respectively liked to do so in MS1 and MS2 (Table 8.11, [E6-1]SQ10e, [E6-2/E6-3]SQ11e, [E6-4/E6-5/E6-6]SQ13e).

The reasons that students liked or did not like using IT for learning in class are presented in Table 8.10 ([E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ3b.ii). In MS1, among those students who liked to use computers in class, 60% of NC and 56% of ID students expressed that they liked it because it enhanced their learning interest. 35% of NC and 24% of ID students indicated that they could work individually with computers. More ID (56%) than NC students (39%) expressed that they liked using computers in class because teachers' explanation and demonstration became more vivid and clear by using computers. In MS2, a statistically significant increase was noted in the percentage of NC students who liked to use computers because they could use computers by themselves (from 35% to 57%). For ID students in MS2, 89% and 71% of them like to use computers because it enhanced "learning interest" and "teachers' explanation and demonstration became more vivid and clear by using computers".

Among those students who did not like to use computers for learning in class, 50% of NC (n=2) and 17% of ID students (n=2) in MS1 indicated that their teachers restricted their use of computers. No statistically significant difference was observed in MS2 for NC students. As for ID students in MS2, 60% (n=3) and 40% (n=2) of them respectively chose the reasons of "do not know how to use computers" and "teachers restrict our use of computers" (Table 8.10, [E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ3c).

Table 8.10 Whether students liked to use computers for learning in class and the reasons they liked or did not like to use computer for learning in class (E6-1/E6-2/E6-3/E6-4/ E6-5/E6-6]SQ3a,b.ii,c)

Students liked to use the computers for learning in class	**Percentage (%) of Students choosing the option**				
	NC		**P-value**	**ID**	
	MS1 (N=81)	**MS2 (N=159)**		**MS1 (N=132)**	**MS2 (N=60)**
YES	95	90	0.191	96	92
NO	5	10		4	8
	(N=77)	**(N=143)**		**(N=126)**	**(N=55)**
Reasons students liked to use computers for learning in class					
Can use the computer by yourself	35	57	0.025*	24	20
Can use computers in small groups	8	5	0.587	12	9
Teachers' explanation and demonstration become more vivid and clear by using computers	39	36	0.961	56	71
Enhance learning interest	60	44	0.094	56	89
Other reasons	10	8	0.392	2	4
Reasons students did not like to use computer for learning in class	**(N=4)**	**(N=16)**		**(N=6)**	**(N=5)**
Do not know how to use computers	0	6	0.892 [c]	17	60
Insufficient number of computers	0	6	0.892 [c]	0	0
Teachers restrict our use of computers	50	75	0.494 [c]	17	40
Other reasons	50	13	0.290 [c]	67	0

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [c.] Mann-Whitney U Test (1-tailed Sig.)

Table 8.11 Whether students liked to use computers for learning beyond school hours ([E6-1]SQ10e, [E6-2/E6-3]SQ11e, [E6-4/E6-5/E6-6]SQ13e)

Students liked to use the computers for learning beyond school hours	Percentage (%) of Students choosing the option				
	NC		*P*-value	ID	
	MS1 (N=80)	MS2 (N=134)		MS1 (N=122)	MS2 (N=60)
YES	81	84	0.775	79	82
NO	19	16		21	18

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

NC students tended to be willing to allocate more time in using IT for learning

Students' attitude towards the use of IT in learning process is reflected by their interest in exploring innovative IT hardware and software and also by their willingness to allocate more time in using IT for learning. When special school students were asked about their interest in using innovative IT tools, techniques and applications, 56% of NC students in MS1 were interested or very interested in the use of emerging innovative IT tools, techniques and applications, with mean rating of 3.63 (SD:0.97) on a scale of 1 to 5 where 1 was 'not interested at all' and 5 was 'very interested'. No statistically significant difference was noted in MS2. As for ID students, 44% and 77% of them in MS1 and MS2 respectively were interested or very interested to do so (Table 8.12, [E6-1]SQ20, [E6-2/E6-3]SQ21, [E6-4/E6-5/E6-6]SQ23). When students were further asked to indicate the extent to which they were willing to allocate more time in using IT for learning, 62% of NC students and 43% of ID students in MS1 reported that they were willing or very willing to do so, with mean ratings of 3.69 (SD:0.94) and 3.12 (SD:1.14) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. No statistically significant difference was observed in MS2. As for ID students, 43% and 37% of them in MS1 and MS2 respectively were willing or very willing to do so (Table 8.12, [E6-1]SQ21, [E6-2/E6-3]SQ22, [E6-4/E6-5/E6-6]SQ24).

Table 8.12 Students' interest in the use of emerging innovative IT tools, techniques and applications as well as their willingness to allocate more time in using IT for learning ([E6-1]SQ20,21, [E6-2/E6-3]SQ21,22, [E6-4/E6-5/E6-6]SQ23,24)

Special school types	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option						Mean (1-5)	SD	N	Count (%) of Students choosing the option						
				Very interested	Interested	Quite interested (一般)	Not interested	Not interested at all					Very interested	Interested	Quite interested (一般)	Not interested	Not interested at all		
Levels of interest in the use of emerging innovative IT tools, techniques and applications Mean: 1="Not interested at all" and 5="Very interested"																			
NC	3.63	0.97	81	16	(20)	29	(36)	28	(35)	6	(7)	2	(2)	3.68	0.95	157	34	(22)	57	(36)	50	(32)	14	(9)	2	(1)	0.690
ID	3.17	1.24	129	18	(14)	39	(30)	43	(33)	10	(7)	21	(16)	3.87	0.62	60	7	(12)	39	(65)	13	(22)	1	(2)	0	(0)	---

Special school types	MS1									MS2									*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option						Mean (1-5)	SD	N	Count (%) of Students choosing the option						
				Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing					Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing		
Levels of willingness to allocate more time in using IT for learning Mean: 1="Totally not willing" and 5="Very willing"																			
NC	3.69	0.94	81	15	(19)	35	(43)	25	(31)	3	(4)	3	(4)	3.61	0.92	155	26	(17)	59	(38)	56	(36)	11	(7)	3	(2)	0.378
ID	3.12	1.14	129	8	(7)	47	(36)	46	(35)	8	(6)	20	(16)	3.36	0.69	59	3	(5)	19	(32)	33	(56)	4	(7)	0	(0)	---

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.1.4 Learning Activities with IT

NC students spent more time on using computers at home than in school while ID students spent more time on using computers in school than at home

The extent to which students use computers for learning is reflected by the frequency in which they use computers in school and after school. Students were asked about the amount of time spent per day on using computers in school, at home or in other places during the week prior to the conduct of the questionnaire survey. Tables 8.13 ([E6-1/E6-3]SQ7i, [E6-2]SQ7g, [E6-4/E6-5/E6-6]SQ8i) and 8.14 ([E6-2]SQ8f, [E6-3]SQ8h, [E6-4/E6-5/E6-6]SQ9h) showed that NC students spent more time on using computers at home than in school while ID students spent more time on using computers in school than at home.

When special school students were asked about the time they spent on computers, 46% of NC and 45% of ID students in MS1 spent less than 2 hours per day on using computers in school (during the lessons and after school) during the week prior to the conduct of the questionnaire survey. 40% of NC and 46% of ID students spent 2 hours or more per day on using computers in school. 15% of NC and 9% of ID students did not use computers in school during the week prior to the conduct of the questionnaire survey (Tables 8.13, [E6-1/E6-3]SQ7i, [E6-2]SQ7g, [E6-4/E6-5/E6-6]SQ8i). No statistically significant difference was noted for the NC students in MS2. As for ID students in MS2, 53% of them spent less than 2 hours per day on using computers in school while 46% of them spent 2 hours or more per day. Only 2% of them did not use computers in school.

As for the usage at home, as reported in MS1, 35% of NC and 47% of ID students spent less than 2 hours per day on using computers at home or in other places during the week prior to the conduct of the questionnaire survey. 23% of NC and 13% of ID students spent 2 to less than 5 hours a day while 24% of NC and 18% of ID students spent more than 5 hours per day. 18% of NC and 22% of ID students did not use computers at home or in other places during the week prior to the conduct of the questionnaire survey (Table 8.14, [E6-2]SQ8f,[E6-3]SQ8h,[E6-4/E6-5/E6-6]SQ9h). No statistically significant difference was observed for NC students in MS2. As for ID students in MS2, 37% of them spent less than 2 hours per day on using computers at home/other places while 25% of them spent 2 hours or more per day. 38% of them did not use computers at home/other places.

Students were given the opportunities to use computers in class other than Computer or IT lessons

When students were asked about their usage of computers in school, the data revealed that there were considerable opportunities for special school students to use computers in class, other than in specific computer lessons. With the exclusion of computer lessons, 17% of NC and 7% of ID students indicated that they did not have any chance to use computers in class at all during the week prior to the conduct of the questionnaire survey in MS1. On the other hand, 71% of NC and 61% of ID students reported that they had a chance to use it 1 to 10 times per week while 12% of NC and 32% of ID students reported that they used computers in class 11 times or more a week in MS1. A statistically significant increase was found in the frequency of NC students using computers for learning in class (from 12% to 41% reported using computers for 11 times or more) in MS2. As for ID students in MS2, 78% of them used computers in class 1 to 10 times a week while 20% of them used computers in class 11 times or more a week. Only 2% of them did not use computers in class. (Table 8.15, [E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ1).

Table 8.13 Average number of hour(s) that students spent per day on using computers (during lessons and after school) in school during the week prior to the conduct of the questionnaire survey ([E6-1/E6-3]SQ7i, [E6-2]SQ7g, [E6-4/E6-5/E6-6]SQ8i)

Average number of hour(s)	Percentage (%) of Students choosing the option					
	NC		$\chi^2_{(df=4)}$	*P*-value	ID	
	MS1 (N=81)	MS2 (N=158)			MS1 (N=128)	MS2 (N=60)
10 hours or more	14	9			16	2
5 to less than 10 hours	5	5			11	12
2 to less than 5 hours	21	18	5.43	0.246	19	32
less than 2 hours	46	55			45	53
Nil	15	13			9	2

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.14 Average number of hour(s) that students spent per day on using computers at home/other places during the week prior to the conduct of the questionnaire survey ([E6-2]SQ8f, [E6-3]SQ8h, [E6-4/E6-5/E6-6]SQ9h)

Average number of hour(s)	Percentage (%) of Students choosing the option					
	NC		$\chi^2_{(df=4)}$	*P*-value	ID	
	MS1 (N=71)	MS2 (N=143)			MS1 (N=124)	MS2 (N=60)
10 hours or more	14	15			8	2
5 to less than 10 hours	10	13			10	10
2 to less than 5 hours	23	24	3.91	0.418	13	13
less than 2 hours	35	37			47	37
Nil	18	11			22	38

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.15 Other than Computer/IT lessons, the frequency of students' use of computers for learning (including teachers' use of computers for teaching) in class during the week prior to the conduct of the questionnaire survey ([E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ1)

Average number of hour(s)	Percentage (%) of Students choosing the option					
	NC		$\chi^2_{(df=4)}$	*P*-value	ID	
	MS1 (N=82)	MS2 (N=159)			MS1 (N=128)	MS2 (N=60)
31 times or more	1	4			14	5
21 to 30 times	6	14			4	3
11 to 20 times	5	23	19.67	0.001**	14	12
1 to 10 times	71	47			61	78
Nil	17	12			7	2

Chi-square Test: *p<0.05; **p<0.01; ***p<0.001

Computers were used frequently in language subjects, General Studies and Mathematics

Students were asked about the subjects (excluding Computer/IT) in which computers were used the most frequently in class during the week prior to the conduct of the questionnaire survey (Table 8.16, [E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ2a). Since there were over thirty-five curriculum areas covered across different categories of special schools, it was difficult to make any generalization about the most common subjects in which IT was used the most frequently in class. However, some examples from different special school types were given as an indication of the ways in which IT was being used. Computers were the most frequently used in General Studies in ID schools (ID-M=MS1: 24%; ID-Mmod=MS1: 59%, MS2: 26%; ID-Mod=MS1: 48%, MS2: 69%; ID-S=MS2: 43%). Other more frequently reported subject areas in different types of special schools were Mathematics (HI=MS1: 56%; VI=MS1: 21%; ID-M=MS1: 22%; ID-Mmod=MS2: 26%; PD=MS2: 31%), English Language (H=MS2: 25%; SSD=MS2: 18%; PD=MS1: 71%, MS2: 21%), Chinese Language (HI=MS1: 44%, MS2: 22%; VI=MS2: 42%), Religious Studies (VI=MS1: 39%), Communications (ID-S=MS1: 29%), Music (H=MS1: 22%) as well as Art and Design (H=MS1: 22%, MS2: 25%) ([E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ2a). Again, these figures must be interpreted with caution due to the small sample size.

Table 8.16 Subjects (excluding Computer/IT lessons) which computers were used the most frequently in class during the week prior to the conduct of the questionnaire survey as reported by students ([[E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ2a)

Subjects which computer was used the most frequently	MS1 Overall (N=192)		H (N=9)		SSD (N=15)		VI (N=28)		HI (N=9)		ID-M (N=49)		ID-Mmod (N=29)		ID-Mod (N=29)		ID-S (N=17)		PD (N=7)	
	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%
Chinese Language	22	11	1	11	1	7	2	7	4	44	7	14	6	21	0	0	0	0	1	14
English Language	10	5	0	0	1	7	2	7	0	0	2	4	0	0	0	0	0	0	5	71
Mathematics	24	13	1	11	1	7	6	21	5	56	11	22	0	0	0	0	0	0	0	0
General Studies	45	23	1	11	-	-	1	4	0	0	12	24	17	59	14	48	0	0	-	-
Chinese History	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0
History	1	1	1	11	-	-	0	0	-	-	-	-	-	-	-	-	-	-	0	0
Putonghua	1	1	0	0	0	0	1	4	0	0	-	-	-	-	-	-	-	-	0	0
Economics and Public Affairs	1	1	0	0	-	-	1	4	-	-	-	-	-	-	-	-	-	-	0	0
Social Studies	0	0	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	0	0
Civil Education	3	2	-	-	-	-	-	-	-	-	0	0	1	3	2	7	0	0	-	-
Geography	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Integrated Science	3	2	0	0	2	13	1	4	0	0	-	-	-	-	-	-	-	-	-	-
Biology	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Computer Studies	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commerce	1	1	-	-	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounting	0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-
Communications	5	3	-	-	-	-	-	-	-	-	0	0	0	0	0	0	5	29	-	-
Personal and Social Education	1	1	-	-	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perceptual Motor Training	3	2	-	-	-	-	-	-	-	-	0	0	1	3	1	3	1	6	-	-
Self-Care	2	1	-	-	-	-	-	-	-	-	1	2	0	0	0	0	1	6	-	-
Independent Living Skills	1	1	-	-	-	-	-	-	-	-	0	0	1	3	0	0	0	0	-	-
Physical Training	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Daily Living Training	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Informal Prevocational Training	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Electronic Engineering	1	1	-	-	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical Drawing	1	1	-	-	1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vehicle Repair	0	0	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Visual Arts	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Music	7	4	2	22	0	0	0	0	0	0	0	0	1	3	2	7	2	12	0	0
Home Economics	1	1	-	-	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0
Art and Craft	1	1	1	11	-	-	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Design and Technology	4	2	-	-	1	7	2	7	0	0	0	0	1	3	0	0	0	0	0	0
Art and Design	2	1	2	22	0	0	-	-	0	0	-	-	-	-	-	-	-	-	0	0
Physical Education	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Religious Studies	11	6	-	-	-	-	11	39	0	0	-	-	-	-	-	-	-	-	-	-
Others	41	21	0	0	5	33	1	4	0	0	16	33	1	3	9	31	8	47	1	14

Table 8.16 Subjects (excluding Computer/IT lessons) which computers were used the most frequently in class during the week prior to the conduct of the questionnaire survey as reported by students ([[E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ2a) (Continued)

Subjects which computer was used the most frequently	MS2 Overall (N=199)		H (N=12)		SSD (N=45)		VI (N=31)		HI (N=23)		ID-M (N=0)		ID-Mmod (N=19)		ID-Mod (N=26)		ID-S (N=14)		PD (N=29)	
	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%
Chinese Language	42	21	0	0	7	16	13	42	5	22	-	-	3	16	3	12	2	14	9	31
English Language	20	10	3	25	8	18	0	0	3	13	-	-	0	0	0	0	0	0	6	21
Mathematics	32	16	2	17	4	9	3	10	4	17	-	-	5	26	5	19	0	0	9	31
General Studies	37	19	1	8	-	-	6	19	1	4	-	-	5	26	18	69	6	43	-	-
Chinese History	1	1	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	1	3
History	0	0	0	0	-	-	0	0	-	-	-	-	-	-	-	-	-	-	0	0
Putonghua	3	2	0	0	0	0	3	10	0	0	-	-	-	-	-	-	-	-	0	0
Economics and Public Affairs	1	1	0	0	-	-	1	3	-	-	-	-	-	-	-	-	-	-	0	0
Social Studies	3	2	-	-	-	-	-	-	3	13	-	-	-	-	-	-	-	-	0	0
Civil Education	1	1	-	-	-	-	-	-	-	-	-	-	1	5	0	0	0	0	-	-
Geography	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Integrated Science	3	2	1	8	1	2	0	0	1	4	-	-	-	-	-	-	-	-	-	-
Biology	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Computer Studies	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Commerce	0	0	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Accounting	0	0	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-
Communications	3	2	-	-	-	-	-	-	-	-	-	-	1	5	0	0	2	14	-	-
Personal and Social Education	2	1	-	-	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perceptual Motor Training	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	-
Self-Care	0	0	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	-
Independent Living Skills	1	1	-	-	-	-	-	-	-	-	-	-	1	5	0	0	0	0	-	-
Physical Training	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Daily Living Training	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Informal Prevocational Training	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
Electronic Engineering	0	0	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Technical Drawing	0	0	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vehicle Repair	0	0	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Visual Arts	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3
Music	2	1	0	0	2	4	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Home Economics	2	1	-	-	0	0	0	0	0	0	-	-	0	0	0	0	0	0	2	7
Art and Craft	4	2	0	0	-	-	0	0	0	0	-	-	0	0	0	0	4	29	-	-
Design and Technology	6	3	-	-	3	7	0	0	1	4	-	-	2	11	0	0	0	0	0	0
Art and Design	12	6	3	25	5	11	-	-	4	17	-	-	-	-	-	-	-	-	0	0
Physical Education	4	2	-	-	3	7	0	0	1	4	-	-	0	0	0	0	0	0	0	0
Religious Studies	3	2	-	-	-	-	3	10	0	0	-	-	-	-	-	-	-	-	-	-
Others	16	8	2	17	10	22	2	7	0	0	-	-	1	5	0	0	0	0	1	3

C=Frequency count.

NC students reported that teachers occasionally used IT in learning activities in school and these activities were mainly confined to information search

Students were asked about the frequency that teachers required them to use IT in subject-based and cross-curricular project-based learning activities in school. The mean values of the frequency which teachers required students to use IT to accomplish these learning tasks across 9 different special school categories are shown in Table 8.17 ([E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ4a-e). The findings indicated that the students in special schools were rarely required to use IT to accomplish different learning tasks with mean ratings below 3.00 except for PD, VI, SSD and ID-M students in MS1 as well as H, SSD, HI, ID-Mmod and PD in MS2. The mean values in which SSD, ID-M and PD students in MS1 as well as H, SSD, HI, ID-Mmod, PD in MS2 were required to use computers for "information search" fell in the range of 3.26-3.88 (SD:1.13-1.36) and 3.14-3.90 (SD:0.92-1.39) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. PD students in MS1 and H students in MS2 also were frequently required to use computers for "information selection" as well as "reporting and presentation", with mean values of 3.38-3.50 (SD:0.76-1.06) and 3.42-3.52 (SD:0.77-1.06) respectively. SSD students were occasionally required to use computers for "information selection" with a mean rating of 3.04 (SD:1.15) in MS1 and 3.30 (SD:1.19) in MS2 .

A statistically significant increase was observed in MS2 in the percentage of NC students using digital resources for learning assigned by teachers beyond school hours whereas a decrease was noted in the percentage of NC students using digital resources on their own initiative for self-learning beyond school hours

Apart from the learning activities at school, it is worthwhile to know the practice of digital learning resources that students have made use of beyond school hours. These learning activities allow students to learn independently and to extend their learning opportunities according to individuals' learning needs and pace. Special school students were asked to indicate the frequency in which their teachers' assigned them to use digital resources to learn subject knowledge beyond school hours. In MS1, 11% of NC and 16% of ID students indicated that their teachers did not assign any digital resources for their learning beyond school hours. Nonetheless, 43% of NC and 34% of ID students used digital resources assigned by their teachers (Table 8.18 [E6-1]SQ9a, [E6-2/E6-3]SQ10a, [E6-4/E6-5/E6-6] SQ11a). Amongst them, 65% of NC and 46% of ID students were asked to use the designated digital resources 1 to 4 times while 16% of NC and 12% of ID respondents reported that their teachers assigned digital resources 5 to 10 times during the week prior to the conduct of the questionnaire survey. 13% of NC and 12% of ID students were asked to use designated digital resources 11 times or more (Table 8.18, [E6-1]SQ9b, [E6-2/E6-3] SQ10b, [E6-4/E6-5/E6-6]SQ11b). A statistically significant increase was noted in the percentage of NC students (from 43% to 54%) in MS2. As for ID students in MS2, 18% indicated that their teachers did not assign any digital resources for their learning beyond school hours. Nonetheless, 82% of ID students used digital resources assigned by their teachers. Amongst them, 83% of ID students were asked to use the designated digital resources 1 to 4 times while 16% of them reported that their teachers assigned digital resources 5 or more during the week prior to the conduct of the questionnaire survey.

As for the use of digital resources assigned by therapists, 80% of NC and 8% of ID students in MS1 reported that the therapists did not assign any digital resources for therapy or training beyond school hours. 13% of NC and 10% of ID students used digital resources assigned by their therapists. No statistically significant difference was noted for NC students in MS2. As for ID students in MS2, 82% of them used digital resources assigned by their therapists (Table 8.18, [E6-4/E6-5/E6-6]SQ12a).

Other than teachers' or therapists' assignments, 48% of NC and 26% of ID students in MS1 took the initiative to make use of digital resources for self-learning beyond school hours (Table 8.18

[E6-1]SQ10a, [E6-2/E6-3]SQ11a, [E6-4/E6-5/E6-6]SQ13a). Among these students, 30% of NC and 47% of ID students used digital resources 1 to 4 times while 27% of NC and 25% of ID respondents reported that they used digital resources 5 to 10 times during the week prior to the conduct of the questionnaire survey. 14% of NC and 22% of ID students used digital resources 11 times a week or more (Table 8.18 [E6-1]SQ10b, [E6-2/E6-3]SQ11b, [E6-4/E6-5/E6-6]SQ13b). A statistically significant decrease was noted in the percentage of NC students (from 48% to 38%) who used digital resources on their own initiative for self-learning beyond school hours in MS2. The frequency of their usage significantly increased statistically in MS2 (from 57% to 70% used the resources 1 to 10 times; from 14% to 28% used the resources 11 times or more). As for ID students in MS2, 20% of them took the initiative to make use of digital resources for self-learning beyond school hours. Amongst them, 92% used digital resources 1 to 4 times during the week prior to the conduct of the questionnaire survey.

Table 8.17 Frequency which teachers required students to use IT to accomplish various tasks in learning activities in school ([E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ4a-e)

	MS1 Overall																																			
	NC					ID					H			SSD			VI			HI			ID-M			ID-Mmod			ID-Mod			ID-S			PD		
	Mean	SD	%1	%2	N	Mean	SD	%1	%2	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
a.	2.97	1.18	23	32	77	2.82	1.60	33	40	112	2.50	1.38	6	3.26	1.36	23	2.84	1.00	31	2.22	0.44	9	3.67	1.30	42	2.50	1.80	32	2.57	1.29	28	1.00	0.00	10	3.88	1.13	8
b.	2.88	1.14	25	34	77	2.20	1.24	15	61	117	2.17	1.17	6	3.04	1.15	23	3.00	1.18	31	2.00	0.50	9	2.72	1.33	47	1.78	0.97	32	2.18	1.16	28	1.10	0.32	10	3.50	0.76	8
c.	2.47	1.30	24	53	76	1.93	1.08	10	71	117	2.33	1.75	6	2.68	1.21	22	2.65	1.40	31	1.44	0.73	9	2.23	0.93	48	1.87	1.15	31	1.82	1.25	28	1.00	0.00	10	2.50	0.93	8
d.	2.65	1.41	32	50	74	2.07	1.08	8	65	113	2.50	1.64	6	2.86	1.36	22	2.72	1.49	29	1.33	0.50	9	2.47	0.99	45	1.87	1.25	30	2.04	0.92	28	1.00	0.00	10	3.38	1.06	8
e.	2.22	1.30	21	60	73	1.85	1.00	7	79	114	2.17	1.17	6	2.59	1.30	22	2.07	1.36	28	1.22	0.44	9	2.27	1.07	45	1.61	1.05	31	1.75	0.65	28	1.00	0.00	10	2.88	1.36	8

NC *P*-value	MS2 Overall																																			
	NC					ID					H			SSD			VI			HI			ID-M			ID-Mmod			ID-Mod			ID-S			PD		
	Mean	SD	%1	%2	N	Mean	SD	%1	%2	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
a. 0.076	3.22	1.21	37	26	157	2.05	1.40	21	70	60	3.90	1.16	14	3.54	1.04	54	2.83	1.34	36	3.67	0.92	24	-	-	-	3.40	1.39	20	1.23	0.43	26	1.64	1.15	14	3.14	1.22	29
b. 0.773	2.75	1.30	27	39	157	1.80	1.29	14	74	60	3.52	0.77	14	3.30	1.19	54	2.39	1.42	36	3.08	1.06	24	-	-	-	3.05	1.47	20	1.04	0.20	26	1.43	0.76	14	2.34	1.14	29
c. 0.779	2.55	1.19	19	47	157	1.87	1.35	17	70	60	2.44	0.90	14	3.26	1.05	54	2.14	1.17	36	2.71	0.91	24	-	-	-	3.40	1.27	20	1.00	0.00	26	1.29	0.61	14	2.00	1.04	29
d. 0.078	2.40	1.30	18	55	157	1.72	1.11	8	82	60	3.42	1.06	14	2.94	1.14	54	1.94	1.58	36	2.71	0.91	24	-	-	-	2.65	1.39	20	1.23	0.43	26	1.29	0.61	14	2.07	1.13	29
e. 0.589	2.38	1.28	18	60	157	1.87	1.33	15	78	60	2.82	1.37	14	3.06	1.23	54	1.97	1.56	36	2.42	0.83	24	-	-	-	3.15	1.60	20	1.23	0.43	26	1.21	0.43	14	1.93	0.70	29

Tasks in learning activities

a. Information search (e.g. using search engine)

b. Information selection

c. Information collation and analysis (e.g. using spreadsheet)

d. Reporting and presentation (e.g. PowerPoint and website presentation)

e. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)

%1= percentage of choosing options 'Very frequently' or 'frequently'; %2= percentage of choosing options 'rarely' or 'never'; Mean (1-5), 1="Never" and 5="Very frequently"; N= Total number of Students;

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.18 Frequency of students using digital resources assigned by teachers/therapists and on their own initiative for self-learning beyond school hours during the week prior to the conduct of the questionnaire survey ([E6-1]SQ9a,b,10a,b, [E6-2/E6-3]SQ10a,11a,b, [E6-4/E6-5/E6-6]SQ11a,12a,b,13a,b)

Digital resources which teachers assigned students to use for learning subject knowledge	**Percentage (%) choosing the option**					
	NC			***P*-value**	**ID**	
	MS1 (N=72)	**MS2 (N=134)**			**MS1 (N=100)**	**MS2 (N=49)**
Yes	43	54		0.017*[a]	34	82
No	57	46			66	18
Teachers didn't assign any digital resources for learning beyond school hours	11	16			16	18
Valid count (N) (excluding no. of students choosing 'Teachers didn't assign any digital resource for learning beyond school hours')						
Frequency	**(N=31)**	**(N=72)**	**$\chi^2_{(df=4)}$**	***P*-value**	**(N=34)**	**(N=40)**
16 times or above	3	7			6	3
11 to 15 times	10	6			6	5
5 to 10 times	16	15	4.96	0.292 [b d] [0.326 [a]]	12	8
1 to 4 times	65	61			46	83
Nil	6	11			31	3
Digital resources which therapists assigned students to use for therapy/training	**Percentage (%) choosing the option**					
	NC			***P*-value**	**ID**	
	MS1 (N=16)	**MS2 (N=51)**			**MS1 (N=113)**	**MS2 (N=49)**
Yes	13	12		0.937[a]	10	82
No	88	88			90	18
Therapists didn't assign any digital resources for learning beyond school hours	80	68			8	18
Valid count (N) (excluding no. of students choosing 'Therapists didn't assign any digital resource for learning beyond school hours')						
Frequency	**(N=2)**	**(N=6)**	**$\chi^2_{(df=4)}$**	***P*-value**	**(N=12)**	**(N=29)**
16 times or above	50	0			8	0
11 to 15 times	0	33			17	0
5 to 10 times	0	0	4.44	0.217 [b d] [0.857 [a c]]	25	3
1 to 4 times	0	33			8	69
Nil	1	33			42	28
Digital resources which students used on their own initiative for self-learning	**Percentage (%) choosing the option**					
	NC			***P*-value**	**ID**	
	MS1 (N=77)	**MS2 (N=151)**			**MS1 (N=122)**	**MS2 (N=60)**
Yes	48	38		0.026*[a]	26	20
No	52	62			74	80
Frequency	**(N=37)**	**(N=57)**	**$\chi^2_{(df=4)}$**	***P*-value**	**(N=32)**	**(N=12)**
16 times or above	3	14			19	0
11 to 15 times	11	14			3	0
5 to 10 times	27	19	25.60	0.000*** [b] [0.009**[a]]	25	0
1 to 4 times	30	51			47	92
Nil	30	2			6	8

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.]Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.
[c.] Mann-Whitney U Test (1-tailed Sig.); [d.] Chi-square Test: Over 20% of cells have expected count less than 5.

8.1.5 Confidence in the Use of IT to Perform Learning Tasks

Information literacy refers to the mastery of software or hardware skills as well as information-processing skills and attitude towards the use of IT (EMB, 2005a). Mastery of information literacy enables our students to develop necessary generic skills for lifelong learning. They include collaboration skills, communication skills, creativity, critical thinking skills, problem-solving skills, self-management skills, study skills, information skills and numeracy skills. These are the fundamental skills for learning which can be developed through the use of IT in different subjects or key learning areas (KLAs), and are transferable to different learning situations.

School heads were quite satisfied (一般) with students' confidence in using IT for learning

With respect to students' confidence in the use of IT in learning, school heads were quite satisfied (一般) with the items listed in Table 8.19. 20% to 31% of school heads were satisfied or very satisfied that students showed the ability to use IT for independent learning, information retrieval and evaluation as well as problem-solving in their daily lives and as a tool in their learning activities in MS1. No statistically significant difference was observed in MS2 ([E1-1/E1-2]HSQ1c-f).

NC students were generally confident in using IT for computing tasks

Students' levels of confidence in using IT to perform respective computing tasks are shown in Table 8.20 ([E6-1]SQ18a-j, [E6-2/E6-3]SQ19a-j, [E6-4/E6-5/E6-6]SQ21a-j). In general, NC students indicated a higher level of confidence than ID students in all the IT-related activities. In MS1, 66%-69% of NC students rated themselves as confident or very confident in "Chinese input" (66%) and "English input" (69%) via the computer, with mean ratings of 3.72 (SD:1.09) and 3.83 (SD:1.02) respectively on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. In other listed learning tasks except for the item of using computer to conduct entertaining activities, 35% to 51% of NC students reported themselves as confident or very confident. 14% to 20% of ID students rated themselves as confident and very confident in all listed learning tasks except for the item of using computer to conduct entertaining activities in MS1. No statistically significant difference was noted for NC students in MS2. 12% to 30% of ID students rated themselves as confident and very confident in all the listed learning tasks in MS2.

NC students tended to be confident in information search

When special school students were asked about their levels of confidence in using IT to perform different learning tasks (Table 8.21, [E6-1]SQ13a.i-v, [E6-2/E6-3]SQ14a.i-v, [E6-4/E6-5/E6-6]SQ16a.i-v), it was found that the mean values of NC students were higher than those of ID students for the same items. In MS1, the ranges of mean values were 2.91 to 3.33 (SD:1.02-1.23) for NC and 2.07 to 2.56 (SD:1.19-1.42) for ID students on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. 46%, 37%, 31%, 39% and 28% of NC students rated themselves as confident or very confident in "information search", "information selection", "information collation and analysis", "reporting and presentation" as well as "self-evaluation on learning outcomes" respectively. No statistically significant difference was observed for NC students in MS2. On the other hand, 13%-31% of ID students in MS1 and 14%-25% in MS2 perceived themselves to be confident or very confident in the aforementioned skills respectively.

Parents generally agreed to students' capability of using IT for information search

Parents' views on the students' capability in performing stated learning tasks with the use of IT are examined. In MS1, 54%, 40%, 25%, 14% and 22% of the surveyed parents of NC students agreed or strongly agreed that their children were capable of using IT to perform "information search", "information selection", "information collation and analysis", "reporting and presentation" as well as "self-evaluation on learning outcomes". 27%, 16%, 9%, 9% and 9% of ID parents agreed or strongly agreed that their children were capable of using IT in the aforementioned skills respectively. The mean values for NC and ID parents fell in a range of 2.46-3.45 (SD:1.03-1.17) and 2.11-2.66 (SD:0.94-1.21) respectively on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. In MS2, 19%-48% of NC parents and 14%-36% of ID parents who agreed or strongly agreed that their children were capable of using IT to perform all the aforementioned learning tasks (Table 8.22, [E7-1/E7-2]PQ4a-e).

NC teachers perceived that students were quite confident (一般) in using IT to complete different learning tasks and solve problems in real-life situations

The confidence level of students in using IT to complete different learning tasks and solve problems in real-life situations is reported by teachers. In MS1, 25% of NC teachers thought that their students were confident in completing different learning tasks and solving real-life problems with the use of IT, with a mean rating of 3.12 (SD:0.62) on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. A statistically significant decrease was noted in NC teachers' perceived level of confidence for students in this aspect (from 25% to 15%) in MS2. On the other hand, around 10% of ID teachers (MS1: 11%, MS2: 12%) thought that their students were confident in doing so, with mean rating of 2.79 (SD:0.65-0.68). (Table 8.23, [E5]TQ19c).

Table 8.19 School heads' levels of satisfaction with students' confidence in using IT for learning ([E1-1/E1-2]HSQ1c-f)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option								Mean (1-5)	SD	N	Count (%) of School Heads choosing the option								
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied	
c	2.91	0.81	54	0	(0)	11	(20)	31	(57)	8	(15)	4	(7)	2.96	0.86	52	1	(2)	11	(21)	29	(56)	7	(13)	4	(8)	0.751
d	3.04	0.89	54	0	(0)	17	(31)	27	(50)	5	(9)	5	(9)	3.06	0.80	52	1	(2)	12	(23)	31	(60)	5	(10)	3	(6)	0.831
e	2.83	0.86	54	0	(0)	12	(22)	25	(46)	13	(24)	4	(7)	2.98	0.94	52	1	(2)	15	(29)	22	(42)	10	(19)	4	(8)	0.375
f	3.00	0.82	54	1	(2)	13	(24)	27	(50)	11	(20)	2	(4)	3.10	0.69	52	1	(2)	12	(23)	30	(58)	9	(17)	0	(0)	0.626

Aspects related to students' use of IT in learning

c. Students can use IT for information retrieval and evaluation of different information sources in their learning activities and to solve problems in their daily lives.
d. Students show the ability to learn independently and to widen their views by using digital resources in their learning activities according to their individual learning needs and pace.
e. Students can select appropriate IT tool(s) to conduct their learning and to solve problems in their daily lives.
f. Students show the ability to use IT as a productivity tool, a communication tool, a collaboration tool, a research tool and a decision-making tool in their learning activities.
Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.20 Students' self-perceived levels of confidence in using IT to perform related computing tasks ([E6-1]SQ18a-j, [E6-2/E6-3]SQ19a-j, [E6-4/E6-5/E6-6]SQ21a-j)

Special school types		MS1													MS2												*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option										Mean (1-5)	SD	N	Count (%) of Students choosing the option										
					Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident					Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident		
NC	a.	3.72	1.09	81	19	(23)	35	(43)	17	(21)	5	(6)	5	(6)	3.67	1.17	159	49	(31)	41	(26)	46	(29)	14	(9)	9	(6)	0.865
	b.	3.83	1.02	81	22	(27)	34	(42)	17	(21)	5	(6)	3	(4)	3.70	1.12	158	46	(29)	45	(28)	48	(30)	11	(7)	8	(5)	0.701
	c.	3.27	1.13	81	12	(15)	22	(27)	30	(37)	10	(12)	7	(9)	3.33	1.23	159	31	(19)	44	(28)	49	(31)	17	(11)	18	(11)	0.515
	d.	3.65	1.11	81	21	(26)	26	(32)	23	(28)	7	(9)	4	(5)	3.47	1.26	159	43	(27)	38	(24)	43	(27)	21	(13)	14	(9)	0.610
	e.	3.43	1.17	81	16	(20)	25	(31)	25	(31)	8	(10)	7	(9)	3.37	1.24	159	35	(22)	41	(26)	47	(30)	20	(13)	16	(10)	0.707
	f.	2.99	1.27	81	10	(12)	19	(23)	27	(33)	10	(12)	15	(19)	3.18	1.31	159	30	(19)	40	(25)	41	(26)	25	(16)	23	(14)	0.195
	g.	3.40	1.16	81	14	(17)	27	(33)	24	(30)	9	(11)	7	(9)	3.38	1.25	159	32	(20)	49	(31)	44	(28)	15	(9)	19	(12)	0.716
	h.	3.04	1.17	81	9	(11)	20	(25)	26	(32)	17	(21)	9	(11)	3.20	1.16	159	25	(16)	35	(22)	62	(39)	21	(13)	16	(10)	0.192
	i.	3.17	1.10	81	8	(10)	25	(31)	29	(36)	11	(14)	8	(10)	3.31	1.16	159	29	(18)	38	(24)	59	(37)	19	(12)	14	(9)	0.258
	j.	3.10	1.22	81	11	(14)	20	(25)	27	(33)	12	(15)	11	(14)	3.24	1.26	158	31	(20)	35	(22)	53	(34)	19	(12)	20	(13)	0.212
ID	a.	2.08	1.40	122	14	(11)	11	(9)	10	(8)	25	(21)	62	(51)	2.45	1.35	60	5	(8)	13	(22)	4	(7)	20	(33)	18	(30)	---
	b.	1.96	1.19	122	7	(5)	11	(9)	10	(8)	37	(30)	57	(47)	2.45	1.37	60	7	(12)	9	(15)	6	(10)	20	(33)	18	(30)	---
	c.	2.20	1.35	122	13	(11)	9	(7)	19	(16)	28	(23)	52	(43)	2.48	0.98	60	2	(3)	10	(17)	8	(13)	35	(58)	5	(8)	---
	d.	2.48	1.50	122	20	(16)	14	(11)	21	(17)	20	(16)	48	(40)	3.05	1.02	60	6	(10)	9	(15)	32	(53)	8	(13)	5	(8)	---
	e.	2.15	1.31	122	11	(9)	9	(7)	19	(15)	31	(25)	52	(43)	2.52	0.95	60	2	(3)	6	(10)	20	(33)	25	(42)	7	(12)	---
	f.	2.08	1.37	122	15	(12)	5	(4)	13	(11)	31	(25)	58	(48)	2.10	1.30	60	3	(5)	9	(15)	8	(13)	11	(18)	29	(48)	---
	g.	2.13	1.28	122	10	(9)	6	(5)	28	(23)	23	(18)	55	(45)	2.60	1.28	60	7	(12)	11	(18)	2	(3)	31	(52)	9	(15)	---
	h.	2.06	1.28	122	9	(8)	9	(7)	19	(16)	26	(22)	58	(48)	2.52	1.05	60	3	(5)	8	(13)	14	(23)	27	(45)	8	(13)	---
	i.	2.21	1.41	122	15	(12)	9	(7)	19	(16)	22	(18)	56	(46)	2.80	0.90	60	2	(3)	7	(12)	34	(57)	11	(18)	6	(10)	---
	j.	2.14	1.39	122	13	(11)	10	(8)	17	(14)	22	(18)	60	(49)	2.35	0.88	60	1	(2)	6	(10)	13	(22)	33	(55)	7	(12)	---

Tasks

a. Chinese input via the computer
b. English input via the computer
c. Using the computer for learning (e.g. browsing electronic books)
d. Using computer to conduct entertaining activities (e.g. playing computer games)
e. Using the computer for daily activities (e.g. reading online newspapers)
f. Using the computer to store/retrieve digital resources (e.g. uploading and downloading files)
g. Searching information on the Internet
h. Using the Internet/other digital resources to conduct self-learning activities
i. Using the Internet/other digital resources to conduct learning activities assigned by teachers
j. Using e-learning platform[#] to conduct learning activities (e.g. browsing documents, submitting assignments and after school discussion)
Mean: 1= ""Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.
[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

Table 8.21 Students' self-perceived levels of confidence in using IT to perform different tasks ([E6-1]SQ13a.i-v, [E6-2/E6-3] SQ14a.i-v, [E6-4/E6-5/E6-6]SQ16a.i-v)

Special school types		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
					Very confident		Confident		Quite confident (一般)		Not confident				Totally not confident		Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident		
NC	i.	3.33	1.08	78	10	(13)	26	(33)	28	(36)	8	(10)	6	(8)	3.65	1.02	152	35	(23)	51	(34)	48	(32)	14	(9)	4	(3)	0.140
	ii.	3.22	1.02	77	8	(10)	21	(27)	33	(43)	10	(13)	5	(6)	3.33	1.04	152	25	(16)	34	(22)	65	(43)	22	(14)	6	(4)	0.672
	iii.	3.03	1.13	75	8	(11)	15	(20)	32	(43)	11	(15)	9	(12)	3.16	1.14	152	23	(15)	27	(18)	69	(45)	17	(11)	16	(11)	0.288
	iv.	3.12	1.23	76	11	(14)	19	(25)	24	(32)	12	(16)	10	(13)	3.16	1.25	152	25	(16)	39	(26)	43	(28)	26	(17)	19	(13)	0.871
	v.	2.91	1.21	76	9	(12)	12	(16)	31	(41)	11	(14)	13	(17)	3.10	1.22	152	28	(18)	20	(13)	59	(39)	29	(19)	16	(11)	0.444
ID	i.	2.56	1.42	118	14	(12)	22	(19)	22	(19)	19	(16)	41	(35)	2.42	1.39	60	5	(8)	10	(17)	15	(25)	5	(8)	25	(42)	---
	ii.	2.42	1.32	118	9	(7)	21	(18)	21	(18)	27	(23)	40	(34)	2.25	1.41	60	7	(12)	5	(8)	11	(18)	10	(17)	27	(45)	---
	iii.	2.16	1.26	116	9	(7)	10	(8)	22	(19)	28	(24)	48	(41)	2.15	1.29	60	3	(5)	9	(15)	9	(15)	12	(20)	27	(45)	---
	iv.	2.10	1.19	118	7	(6)	10	(8)	21	(18)	33	(28)	48	(41)	2.08	1.15	60	1	(2)	7	(12)	15	(25)	10	(17)	27	(45)	---
	v.	2.07	1.20	118	7	(6)	9	(7)	24	(20)	26	(22)	53	(45)	2.12	1.34	60	5	(8)	6	(10)	9	(15)	11	(18)	29	(48)	---

Tasks

i. Information search (e.g. using search engine) *ii. Information selection*

iii. Information collation and analysis (e.g. using spreadsheet) *iv. Reporting and Presentation (e.g. PowerPoint and website presentation)*

v. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.22 Parents' levels of agreement on students' capability of using IT to perform different tasks ([E7-1/7-2]PQ4a-e)

Special school types		MS1										MS2									
		Mean (1-5)	SD	N	Count (%) of Parents choosing the option							Mean (1-5)	SD	N	Count (%) of Parents choosing the option						
					Strongly agree		Agree		Neutral (一般)		Disagree		Strongly disagree				Strongly agree		Agree		Neutral (一般)		Disagree		Strongly disagree	
NC	a.	3.45	1.03	33	4	(12)	14	(42)	10	(30)	3	(9)	2	(6)	3.36	1.04	81	10	(12)	29	(36)	26	(32)	12	(15)	4	(5)
	b.	3.14	1.11	28	3	(11)	8	(29)	9	(32)	6	(21)	2	(7)	3.04	0.92	82	3	(4)	22	(27)	37	(45)	15	(18)	5	(6)
	c.	2.79	1.17	28	3	(11)	4	(14)	8	(29)	10	(36)	3	(11)	2.75	0.91	80	2	(3)	13	(16)	34	(43)	25	(31)	6	(8)
	d.	2.46	1.07	28	2	(7)	2	(7)	7	(25)	13	(46)	4	(14)	2.69	1.02	77	2	(3)	16	(21)	24	(31)	26	(34)	9	(12)
	e.	2.74	1.06	27	2	(7)	4	(15)	8	(30)	11	(41)	2	(7)	2.74	0.94	74	1	(1)	16	(22)	26	(35)	25	(34)	6	(8)
ID	a.	2.66	1.21	74	5	(7)	15	(20)	19	(26)	20	(27)	15	(20)	3.01	1.12	70	6	(9)	19	(27)	22	(31)	16	(23)	7	(10)
	b.	2.36	1.03	73	1	(1)	11	(15)	17	(23)	28	(38)	16	(22)	2.81	1.04	68	2	(3)	18	(26)	20	(29)	21	(31)	7	(10)
	c.	2.16	0.94	75	1	(1)	6	(8)	16	(21)	33	(44)	19	(25)	2.56	0.97	64	3	(5)	6	(9)	22	(34)	26	(41)	7	(11)
	d.	2.11	0.94	72	1	(1)	6	(8)	12	(17)	34	(47)	19	(26)	2.61	0.97	69	2	(3)	11	(16)	21	(30)	28	(41)	7	(10)
	e.	2.16	0.94	73	1	(1)	6	(8)	15	(21)	33	(45)	18	(25)	2.71	0.87	66	2	(3)	8	(12)	29	(44)	23	(35)	4	(6)

Tasks

a. Information search (e.g. using search engine) *b. Information selection*

c. Information collation and analysis (e.g. using spreadsheet) *d. Reporting and Presentation (e.g. PowerPoint and website presentation)*

e. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/learning records)

Mean: 1="Totally not confident" and 5="Very confident"

Table 8.23 Teachers' perception of students' levels of confidence in using IT to complete different learning tasks and solve problems in real-life situations ([E5]TQ19c)

Special school types	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident				Very confident		Confident		Quite confident (一般)		Not confident		Totally not confident		
NC	3.12	0.62	102	0	(0)	26	(25)	62	(61)	14	(14)	0	(0)	2.92	0.61	136	0	(0)	20	(15)	85	(63)	31	(23)	0	(0)	0.014*
ID	2.79	0.68	87	0	(0)	10	(11)	52	(60)	22	(25)	3	(3)	2.79	0.65	57	0	(0)	7	(12)	31	(54)	19	(33)	0	(0)	----

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.1.6 Learning Support

Students mainly learnt to use software and hardware from Computer/IT curriculum in school

Students need support from schools, homes and other sources in their learning of IT. The two most common channels in which students fully or mostly learnt to use the software and hardware were the Computer or IT curriculum in schools [except hospital schools] (43% of NC, 34% of ID) and Computer or IT-related extra-curricular activities in schools [except hospital schools] (29% of NC, 21% of ID). 18% of NC and 10% of ID students indicated that they fully or mostly learnt those skills from training activities organised by outside school organisations. No statistically significant difference was observed in MS2 for NC students. As for ID students in MS2, the most common channel in which students fully or mostly learnt to use the software and hardware was "Computer/IT-related extra-curricular activities in original school" (44%), followed by "Computer or IT curriculum in original school" (38%) and "parents/relatives" (35%) (Table 8.24, [E6-1]SQ17a-g, [E6-2/E6-3]SQ18a-e, [E6-4/E6-5/E6-6]SQ20a-e).

Students tended to perceive the learning support from teachers to be sufficient while teachers indicated occasional provision of learning support for students

Students need support from schools, homes and other sources in their learning of IT. Table 8.25 shows the frequency and sufficiency of learning support that students received from teachers. In MS1, 53% of NC and 47% of ID students reported that their teachers frequently or very frequently gave them support when they encountered difficulties in performing the learning activities with the use of IT, with mean ratings of 3.60 (SD:1.11) and 3.41 (SD:1.19) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 8.25, [E6-1]SQ13b, [E6-2/E6-3]SQ14b, [E6-4/E6-5/E6-6]SQ16b). To compare with the responses from teachers, 37% and 39% of NC and ID teachers respectively indicated that they frequently or very frequently provided learning support for their students when using IT, with mean ratings of 3.16 (SD:0.95) and 3.15 (SD:1.04) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 8.25, [E5]TQ14b). No statistically significant difference was reported in MS2 for NC side. As for the ID side in MS2, 62% of the students and 43% of the teachers respectively reported that they frequently or very frequently received/provided learning support.

Regarding the sufficiency of learning support received from teachers, 59% of NC and 45% of ID students in MS1 considered the support from teachers as sufficient or very sufficient, with mean ratings of 3.64 (SD:1.04) and 3.44 (SD:0.92) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted in MS2 for NC students. 77% of ID students considered such support as sufficient or very sufficient in MS2 (Table 8.25, [E6-1]SQ13c, [E6-2/E6-3]SQ14c, [E6-4/E6-5/E6-6] SQ16c).

Table 8.24 The channel(s) from which students learnt the software and hardware skills ([E6-1]SQ17a-g, [E6-2/E6-3]SQ18a-e, [E6-4/E6-5/E6-6]SQ20a-e)

Special school types		MS1 Mean (1-5)	SD	N	MS1 Count (%) of Students choosing the option: Fully	Mostly	Partly	Rarely	None	MS2 Mean (1-5)	SD	N	MS2 Count (%) of Students choosing the option: Fully	Mostly	Partly	Rarely	None	*P*-value
NC	a.	2.89	0.97	80	5 (6)	12 (15)	38 (48)	19 (24)	6 (8)	2.87	1.22	158	19 (12)	27 (17)	51 (32)	37 (23)	24 (15)	0.334
	b.	2.50	0.85	10	0 (0)	1 (10)	4 (40)	4 (40)	1 (10)	2.75	1.29	16	2 (13)	1 (6)	8 (50)	1 (6)	4 (25)	0.376 [c]
	c.	3.33	1.04	80	11 (14)	23 (29)	31 (39)	11 (14)	4 (5)	3.27	1.22	158	25 (16)	47 (30)	52 (33)	13 (8)	21 (13)	0.927
	d.	1.90	1.10	10	0 (0)	1 (10)	2 (20)	2 (20)	5 (50)	2.38	1.26	16	5 (6)	1 (6)	7 (44)	1 (6)	6 (38)	0.579 [c]
	e.	2.81	1.23	80	5 (10)	15 (19)	26 (33)	16 (20)	15 (19)	2.91	1.26	158	18 (11)	35 (22)	47 (30)	30 (19)	28 (18)	0.748
	f.	2.54	1.23	80	7 (9)	8 (10)	27 (34)	17 (21)	21 (26)	2.70	1.33	158	20 (13)	21 (13)	50 (32)	26 (16)	41 (26)	0.493
	g.	2.23	1.28	80	4 (5)	10 (13)	22 (28)	8 (10)	36 (45)	2.16	1.38	158	17 (11)	11 (7)	30 (19)	23 (15)	77 (49)	0.045
ID	a.	2.09	1.30	116	8 (7)	8 (7)	31 (27)	8 (7)	61 (53)	2.22	1.03	60	3 (5)	2 (3)	15 (25)	25 (42)	15 (25)	---
	c.	2.65	1.46	116	14 (12)	25 (22)	27 (24)	7 (6)	43 (37)	2.92	1.20	60	2 (3)	21 (35)	20 (33)	4 (7)	13 (22)	---
	e.	2.42	1.34	116	10 (8)	15 (13)	36 (31)	11 (10)	45 (39)	2.88	1.35	60	4 (7)	22 (37)	14 (23)	3 (5)	17 (28)	---
	f.	2.36	1.28	116	9 (7)	11 (9)	38 (33)	14 (12)	44 (38)	2.86	1.18	59	2 (3)	19 (32)	19 (32)	7 (12)	12 (20)	---
	g.	1.95	1.25	117	9 (7)	4 (3)	25 (21)	15 (13)	65 (55)	2.27	1.16	59	3 (5)	4 (7)	19 (32)	13 (22)	20 (34)	---

Channels which students learnt to use software/hardware

a. Fellow students/Friends
b. Computer/IT curriculum in Hospital School
c. Computer/IT curriculum in the original school
d. Computer/IT-related extra-curricular activities in Hospital School
e. Computer/IT-related extra-curricular activities in original school
f. Parents/Relatives
g. Training activities organised by outside school organisations (e.g. computer companies and community centres)

Mean: 1= "None" and 5="Fully"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [c] Mann-Whitney U Test (1-tailed Sig.)

Table 8.25 The frequency in which teachers give learning support for students when they encounter difficulties in performing the learning activities with the use of IT and students' levels of sufficiency to such support from teachers ([E6-1]SQ13b,c, [E6-2/E6-3] SQ14b,c, [E6-4/E6-5/E6-6]SQ16b,c, [E5]TQ14b)

Special school types/ stakeholders	MS1 Mean (1-5)	SD	N	MS1 Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	MS2 Mean (1-5)	SD	N	MS2 Count (%) of Students choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	*P*-value
Level of frequency Mean: 1="Never" and 5="Very frequently"																	
NC Students	3.60	1.11	78	19 (24)	23 (29)	27 (35)	4 (5)	5 (6)	3.35	1.01	154	22 (14)	45 (29)	56 (36)	27 (18)	4 (3)	0.361
ID Students	3.41	1.19	118	27 (23)	28 (24)	39 (33)	16 (13)	9 (7)	3.50	0.81	60	1 (2)	36 (60)	18 (30)	2 (3)	3 (5)	---
NC Teachers	3.16	0.95	102	7 (7)	31 (30)	38 (37)	23 (23)	3 (3)	3.19	0.78	136	3 (2)	46 (34)	63 (46)	22 (16)	2 (1)	0.725
ID Teachers	3.15	1.04	87	6 (7)	28 (32)	34 (39)	11 (13)	8 (9)	3.12	1.27	58	8 (14)	17 (29)	16 (28)	8 (14)	9 (16)	---

Special school types	MS1 Mean (1-5)	SD	N	MS1 Count (%) of Students choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally insufficient	MS2 Mean (1-5)	SD	N	MS2 Count (%) of Students choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally insufficient	*P*-value
Level of sufficiency Mean: 1="Totally insufficient" and 5="Very sufficient"																	
NC Students	3.64	1.04	78	16 (21)	30 (38)	25 (32)	2 (3)	5 (6)	3.53	0.84	157	19 (12)	60 (38)	65 (41)	11 (7)	2 (1)	0.730
ID Students	3.44	0.92	118	16 (14)	37 (31)	51 (43)	12 (10)	2 (2)	3.72	0.78	60	3 (5)	43 (72)	11 (18)	0 (0)	3 (5)	---

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.1.7 School ITEd Curriculum

School heads were satisfied that students were given the opportunities to learn about IT knowledge and skills

Table 8.26 ([E1-1/E1-2]HSQ3a,c) showed that school heads tended to be satisfied with the provision of school ITEd curriculum which helped to develop students' IT skills and to foster the development of information literacy and generic skills through the application of such skills in learning activities across the KLAs. In MS1, 74% of school heads were satisfied or very satisfied that students were "given the opportunities to learn about IT knowledge and skills", with a mean rating of 3.93 (SD:0.77). Half of them (52%) were also satisfied or very satisfied that the school curriculum provided "a learning context for students to use IT to acquire learning resources and also as a tool for learning, solving problems and sharing their achievements", with a mean rating of 3.52 (SD:0.69) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. There was no statistically significant difference for these two aspects in MS2.

Nearly all schools offered Computer or IT subjects

Nearly all special schools (98%) offered Computer or IT subjects ([E3]ITEdInfoQ7a). As for the software taught in Computer or IT subject in MS1, "word processing software", "online information searching tools" and "Chinese input" were taught in senior primary levels (between 56% and 63%). "Word processing software", "presentation software", "online communication software", "online information searching tools" as well as "computer graphics design" and "Chinese input" were taught in elementary secondary levels (between 63% and 70%). Around 50% of schools did not teach "spreadsheet" (50%) and "web design or editing software" (54%). Over 70% of schools did not include "programming" (78%), "multi-media design" (72%) and "audio or video editing software" (70%) in the curriculum (Table 8.27, [E3]ITEdInfoQ8a).

As far as the teaching of hardware skills in Computer or IT subject was concerned in MS1, the "keyboard" was taught in primary levels (56% for elementary primary and 65% for senior primary levels) and elementary secondary levels (61%) of the special schools. The use of "printer" (63%) and "CD-ROM writer" (54%) were taught in senior primary levels. The use of "printer" (61%), "CD-ROM writer" (69%), "digital camera" (67%), "scanner" (57%) and "digital video recorder" (52%) were taught in elementary secondary levels. Over 68% of schools did not teach how to use "mobile devices" (74%) and "network devices" (69%) in the curriculum (Table 8.27, [E3]ITEdInfoQ8b).

Regarding the contents related to the information literacy skills taught in Computer or IT curriculum, as reported in MS1, the information-processing skills and correct attitude of using IT were mainly developed in elementary secondary levels of special schools. More than 50% of schools included "information search" (70%), "information selection" (63%), "information collation and analysis" (57%), "reporting and presentation" (57%), "intellectual property awareness" (72%), "personal data privacy awareness" (65%) and "proper use of IT such as Internet security" (70%) in the curriculum of elementary secondary levels. "Information search" (61%) and "proper use of IT" (56%) were also taught in senior primary levels (Table 8.27, [E3]ITEdInfoQ8c).

No statistically significant difference was observed in the percentages of schools which taught the use of different software and hardware as well as the correct attitude of using IT in the Computer/IT curriculum in MS2.

Table 8.26 School heads' levels of satisfaction with the opportunities given to students' use of IT in learning ([E1-1/E1-2]HSQ3a,c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied	
a	3.93	0.77	54	12	(22)	28	(52)	12	(22)	2 (4)	4.10	0.53	52	10	(19)	37	(71)	5	(10)	0 (0)	0.269
c	3.52	0.69	54	3	(6)	25	(46)	23	(43)	3 (6)	3.67	0.71	52	3	(6)	33	(63)	12	(23)	4 (8)	0.149

Aspects related to students' use of IT in learning

a. Students are given the opportunities to learn about IT knowledge and skills.

c. The school curriculum provides a learning context for students to use IT to acquire learning resources and also as a tool for learning, solving problems and sharing their achievements.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.27 Contents of Computer/IT curriculum in teaching software, hardware and information literacy ([E3]ITEdInfoQ8a-c)

Contents of Computer/IT curriculum	Percentage (%) choosing the options								*P*-value			
	MS1				MS2							
	Elementary Primary	Senior Primary	Elementary Secondary	Not being taught in special school	Elementary Primary	Senior Primary	Elementary Secondary	Not being taught in special school	Elementary Primary	Senior Primary	Elementary Secondary	Not being taught in special school
	(N=54)				(N=52)							
Software												
i. Word processing software	22	63	70	24	25	65	71	13	0.737	0.796	0.930	0.165
ii. Spreadsheet	0	33	46	50	2	29	48	44	0.308	0.620	0.855	0.554
iii. Presentation software	7	44	63	31	10	46	69	21	0.685	0.860	0.498	0.230
iv. Online communication software (e.g. E-mail)	13	50	67	28	12	46	69	21	0.824	0.693	0.778	0.430
v. Online information searching tools (e.g. browser and search engine)	28	59	69	22	29	75	79	10	0.903	0.086	0.230	0.078
vi. Web design/editing software	0	9	44	54	0	15	52	44	1.000	0.339	0.443	0.332
vii. Computer graphic design (e.g. drawing and photo editing)	22	46	63	31	13	48	75	19	0.242	0.855	0.183	0.150
viii. Multi-media design (e.g. animation design)	0	7	24	72	0	10	33	63	1.000	0.685	0.327	0.336
ix. Programming (e.g. Logo and Java)	0	7	20	78	0	8	25	69	1.000	0.956	0.571	0.321
x. Audio/Video editing software (e.g. editing and file format conversion)	4	7	24	70	0	12	33	63	0.163	0.469	0.327	0.452
xi. Chinese input	13	56	67	26	15	56	79	15	0.722	0.982	0.162	0.183
Hardware												
i. Printer (打印機)	31	63	61	17	42	71	71	10	0.250	0.372	0.277	0.286
ii. CD-ROM (CD-R or DVD-R) Writer (光碟機/光碟燒錄機)	28	54	69	22	37	73	75	12	0.336	0.040	0.461	0.145
iii. Digital Camera (數碼相機)	17	44	67	28	25	54	81	12	0.293	0.335	0.101	0.037
iv. Digital Video Recorder (數碼攝錄機)	2	17	52	46	4	27	60	35	0.538	0.202	0.423	0.223
v. Scanner (掃描器)	11	33	57	33	10	38	69	19	0.802	0.584	0.209	0.101
vi. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)])	2	11	22	74	2	12	21	73	0.979	0.945	0.894	0.908
vii. Network Devices (e.g. Domestic Network Devices)	0	9	30	69	2	8	21	75	0.308	0.773	0.319	0.461
viii. Use of Keyboard	56	65	61	11	69	67	63	10	0.148	0.787	0.804	0.802
Information Literacy												
i. Information search	24	61	70	20	23	65	75	15	0.904	0.650	0.595	0.505
ii. Information selection	7	37	63	33	4	38	75	21	0.430	0.880	0.183	0.162
iii. Information collation and analysis	7	33	57	39	6	19	71	25	0.735	0.101	0.142	0.127
iv. Reporting and Presentation	4	37	57	39	10	35	71	23	0.223	0.796	0.142	0.080
v. Intellectual Property Awareness	15	44	72	26	19	48	83	13	0.547	0.709	0.200	0.109
vi. Personal Data Privacy Awareness	11	35	65	31	13	42	77	19	0.714	0.454	0.173	0.150
vii. Proper use of IT (e.g. Internet security)	24	56	70	24	19	56	79	15	0.547	0.982	0.319	0.264

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.2 Empowering Teachers with IT

The second strategic goal is "Empowering teachers with IT". The purpose is to enable teachers to make good pedagogical use of IT so as to stimulate students' thinking or facilitate students to construct their own knowledge. To track the progress of this goal, the following aspects related to teachers' use of IT in teaching are examined:

- Teachers' IT competency
- Perceived application of IT in teaching
- Belief and attitude towards using IT for learning and teaching
- Teaching with IT
- Confidence in using IT for learning and teaching
- School professional development in ITEd for teachers
- School ITEd sharing and collaboration among teachers
- Areas for improvement of ITEd development

8.2.1 Teachers' IT Competency

School heads tended to be very satisfied with teachers' IT competency

Teachers should acquire adequate IT competency in order to use IT in conducting administrative and teaching duties. 96% of school heads were satisfied or very satisfied with teachers' IT competency in MS1. No statistically significant difference was found in MS2 (Table 8.28, [E1-1/E1-2]HSQ2a)

Table 8.28 School heads' levels of satisfaction with teachers' IT competency ([E1-1/E1-2] HSQ2a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"Teachers' IT competency meets the requirements of Education and Manpower Bureau."									
MS1	4.30	0.54	54	18 (33)	34 (63)	2 (4)	0 (0)	0 (0)	0.094
MS2	4.12	0.55	52	11 (21)	36 (69)	5 (10)	0 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers were generally proficient in software and hardware skills

When looking at teachers' self-evaluated proficiency in terms of software skills, 61% to 86% of the teachers perceived that they were proficient or highly proficient in using software such as "word processing software" (NC=MS1:76%, MS2: 83%; ID=MS1: 83%, MS2: 84%), "presentation software" (NC=MS1: 69%, MS2: 77%; ID=MS1: 79%, MS2: 67%), "online communication software" (NC=MS1: 86%, MS2: 85%; ID=MS1: 79%, MS2: 67%), "online information searching tools" (NC=MS1: 80%; MS2: 86%; ID=MS1: 76%, MS2: 73%) and "Chinese input" (NC=MS1: 61%, MS2: 62%; ID=MS1: 76%, MS2: 72%). Proficiency in using spreadsheet was average (NC=MS1: 43%, MS2: 41%; and ID teachers=MS1: 41%, MS2: 47% rated themselves as proficient or highly proficient). Teachers' competency in using more advanced tools: "computer graphic design" (NC=MS1=MS2: 29%; ID=MS1: 34%, MS2: 23%), "web design or editing software" (NC=MS1: 27%, MS2: 24%; ID=MS1: 23%, MS2: 16%), "audio or video editing software" (NC=MS1: 24%, MS2: 19%; ID=MS1: 20%, MS2: 33%) and "multi-media design software" (NC=MS1: 17%, MS2: 11%; ID=MS1: 14%, MS2: 12%) were all relatively low, with less than 35% of the teachers rated themselves as proficient or highly proficient. The software with the lowest proportion of the surveyed teachers rated themselves as proficient or highly proficient users was "programming" (NC=MS1: 12%;

MS2: 8%; ID=MS1: 4%, MS2: 12%). No statistically significant difference was noted for NC teachers in MS2 (Table 8.29a, [E5]TQ31a-k).

The pattern of therapists' self-evaluated proficiency in using software is similar to that of teachers. Higher proportion of the therapists in MS1 rated themselves as proficient or highly proficient in using the following software such as: "word processing software" [SPH=MS1: 72%(n=8), MS2: 89% (n=8); PHY=MS1: 84% (n=5), MS2: 100% (n=7); OC=MS1: 100% (n=7), MS2: 73% (n=8)], "presentation software" [SPH=MS1: 63% (n=7), MS2: 66% (n=6); PHY=MS1: 67% (n=4), MS2: 100% (n=7); OC=MS1: 100%, MS2: 64% (n=7)], "online communication software" [SPH=MS1: 72% (n=8), MS2: 66% (n=6); PHY=MS1: 83% (n=5), MS2: 100% (n=7); OC=MS1: 86% (n=6), MS2: 64% (n=7)] and "online information searching tools" [SPH=MS1: 63%, (n=7) MS2: 66% (n=6); PHY=MS1: 66% (n=4), MS2: 85% (n=6); OC=MS1: 100% (n=7), MS2: 73% (n=8)]. 63% (n=7) and 67% (n=6) of SPH, 33% (n=2) and 86% (n=6) of PHY as well as 43% (n=3) and 45% (n=5) of OC therapists in MS1 and MS2 respectively rated themselves as proficient or highly proficient in Chinese input. Therapists' competency in using more advanced tools, for examples, "web design or editing software", "multi-media design software", "audio or video editing software" and "programming" were relatively low, with less than 23% of the therapists (n=1-2) rated themselves as proficient or highly proficient and mean ratings were below 2.60 on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient' (Table 8.29b, [E8]THQ27a-k).

When looking at teachers' self-evaluated proficiency of hardware skills, higher proportions of the teachers rated themselves as proficient or highly proficient in the usage of "printer" (NC=MS1: 83%; MS2: 82%; ID=MS1: 80%, MS2: 82%), "CD-ROM writer" (NC=MS1: 75%; MS2: 74%; ID=MS1: 71%, MS2: 77%), and "keyboard" (NC=MS1: 74%; MS2: 80%; ID=MS1: 73%, MS2: 77%). These were followed by "digital camera" (NC=MS1: 65%; MS2: 68%; ID=MS1: 70%, MS2: 74%), "scanner" (NC=MS1: 60%; MS2: 68%; ID=MS1=MS2: 68%) and "digital video recorder" (NC=MS1: 54%; MS2: 60%; ID=MS1: 59%, MS2: 65%). Lower proportions of the teachers reported themselves as proficient or highly proficient in using all other hardware such as "LCD projector" (NC=MS1: 37%; MS2: 34%; ID=MS1: 37%, MS2: 33%), "network devices" (NC=MS1: 36%; MS2: 30%; ID=MS1: 33%, MS2: 35%), "mobile devices" (NC=MS1: 35%; MS2: 27%; ID=MS1: 28%, MS2: 33%) and "portable multi-media player devices" (NC=MS1: 27%; MS2: 25%; ID=MS1: 28%, MS2: 35%). No statistically significant difference was found for NC teachers in MS2 (Table 8.30a, [E5]TQ32a-k).

The pattern of therapists' self-evaluated proficiency in using hardware is similar to that of teachers. In MS1, higher proportions of the therapists rated themselves as proficient or highly proficient in using the following hardware: "printer" [SPH=MS1: 82% (n=9), MS2: 88% (n=8); PHY=MS1: 83% (n=5), MS2: 86% (n=6); OC=MS1: 86% (n=6), MS2: 73% (n=8)], "CD-ROM writer" [SPH=MS1: 64% (n=7), MS2: 55% (n=5); PHY=MS1: 66% (n=4), MS2: 85% (n=6); OC=MS1: 86%, MS2: 54% (n=6)], "keyboard" [SPH=MS1: 72%, MS2: 89% (n=8); PHY=MS1: 66% (n=4), MS2: 100% (n=7); OC=MS1: 100% (n=7), MS2: 73% (n=8)] and "digital camera" [SPH=MS1: 73% (n=8), MS2: 66% (n=6); PHY=MS1: 50% (n=3), MS2: 100% (n=7); OC=MS1: 100% (n=7), MS2: 54% (n=6)]. These were followed by "digital video recorder" [SPH=MS1: 54% (n=6), MS2: 55% (n=5); PHY=MS1: 33% (n=2), MS2: 71% (n=5); OC=MS1: 100% (n=7), MS2: 36% (n=4)] and "scanner" [SPH=MS1: 45% (n=5), MS2: 55% (n=5); PHY=MS1: 50% (n=3), MS2: 57% (n=4); OC=MS1: 86% (n=6), MS2: 27% (n=3)]. Higher proportions of SPH and PHY therapists reported themselves as not proficient or know nothing in the use of hardware such as "network devices" [SPH=MS1: 54% (n=6), MS2: 55% (n=5); PHY=MS1: 67% (n=4), MS2: 43% (n=3)], "mobile devices" [SPH=MS1: 54% (n=6), MS2: 44% (n=4); PHY=MS1: 67% (n=4), MS2: 43% (n=3)], "LCD projector" [SPH=MS1: 45% (n=5), MS2: 44% (n=4); PHY=MS1: 50% (n=3), MS2: 43% (n=3)] and "portable multi-media player

devices" [SPH=MS1: 63% (n=7), MS2: 78% (n=7); PHY=MS1: 67% (n=4), MS2: 29% (n=2)], with mean ratings below 2.87 on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'. OC therapists tended to perceived themselves as proficient in using "mobile devices", network devices" and "portable multi-media player devices" whereas they rated themselves as quite proficient (一般) in using "LCD projectors" in MS1. In MS2, they tended to rate themselves as quite proficient (一般) in using these hardware except for "network devices" (Table 8.30b, [E8]THQ28a-k).

Table 8.29a Teachers' self-evaluated levels of proficiency in software use ([E5]TQ31a-k)

Special school types		MS1												MS2												*P*-value
		Mean (1-5)	SD	N	Count (%) of Teachers choosing the option									Mean (1-5)	SD	N	Count (%) of Teachers choosing the option									
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all				Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		
NC	a.	3.99	0.73	103	25	(24)	54	(52)	22	(21)	2	(2)	0	(0)	4.01	0.66	135	26	(19)	87	(64)	20	(15)	1	(1)	1	(1)	0.832
	b.	3.36	0.87	103	9	(9)	35	(34)	45	(44)	12	(12)	2	(2)	3.26	0.91	135	8	(6)	47	(35)	58	(43)	16	(12)	6	(4)	0.519
	c.	3.84	0.78	103	20	(19)	51	(50)	28	(27)	4	(4)	0	(0)	3.90	0.74	135	24	(18)	80	(59)	26	(19)	4	(3)	1	(1)	0.454
	d.	4.10	0.67	102	26	(25)	62	(61)	12	(12)	2	(2)	0	(0)	4.06	0.62	134	29	(22)	85	(63)	19	(14)	1	(1)	0	(0)	0.539
	e.	3.99	0.76	103	24	(23)	59	(57)	15	(15)	5	(5)	0	(0)	4.08	0.61	135	30	(22)	87	(64)	17	(13)	1	(1)	0	(0)	0.513
	f.	2.82	0.98	102	2	(2)	26	(25)	35	(34)	30	(29)	9	(9)	2.81	0.98	134	3	(2)	30	(22)	55	(41)	31	(23)	15	(11)	0.997
	g.	2.80	1.12	103	5	(5)	25	(24)	33	(32)	24	(23)	16	(16)	2.81	1.10	134	6	(4)	33	(25)	45	(34)	30	(22)	20	(15)	0.896
	h.	2.17	1.14	103	2	(2)	15	(15)	20	(19)	28	(27)	38	(37)	2.06	1.10	135	3	(2)	12	(9)	32	(24)	31	(23)	57	(42)	0.428
	i.	1.77	1.09	103	1	(1)	11	(11)	12	(12)	18	(17)	61	(59)	1.67	1.08	134	5	(4)	5	(4)	18	(13)	19	(14)	87	(65)	0.386
	j.	2.25	1.25	102	2	(2)	22	(22)	16	(16)	21	(21)	41	(40)	2.27	1.20	134	5	(4)	20	(15)	29	(22)	32	(24)	48	(36)	0.821
	k.	3.57	1.16	102	22	(22)	40	(39)	22	(22)	10	(10)	8	(8)	3.62	1.20	133	32	(24)	51	(38)	31	(23)	5	(4)	14	(11)	0.673
ID	a.	4.09	0.74	88	25	(28)	48	(55)	14	(16)	0	(0)	1	(1)	4.07	0.62	58	13	(22)	36	(62)	9	(16)	0	(0)	0	(0)	---
	b.	3.31	0.89	88	6	(7)	30	(34)	41	(47)	7	(8)	4	(5)	3.38	0.89	58	4	(7)	23	(40)	25	(43)	3	(5)	3	(5)	---
	c.	3.97	0.78	88	20	(23)	49	(56)	16	(18)	2	(2)	1	(1)	3.67	0.87	58	7	(12)	32	(55)	13	(22)	5	(9)	1	(2)	---
	d.	3.95	0.84	88	21	(24)	48	(55)	15	(17)	2	(2)	2	(2)	3.78	0.82	58	10	(17)	29	(50)	15	(26)	4	(7)	0	(0)	---
	e.	3.97	0.84	88	23	(26)	44	(50)	17	(19)	3	(3)	1	(1)	3.93	0.83	58	15	(26)	27	(47)	13	(22)	3	(5)	0	(0)	---
	f.	2.85	1.00	88	3	(3)	18	(20)	41	(47)	15	(17)	11	(13)	2.40	1.11	58	1	(2)	8	(14)	21	(36)	11	(19)	17	(29)	---
	g.	3.18	1.03	88	10	(11)	20	(23)	40	(45)	12	(14)	6	(7)	2.48	1.17	58	1	(2)	12	(21)	18	(31)	10	(17)	17	(29)	---
	h.	2.26	1.17	88	3	(3)	10	(11)	26	(30)	17	(19)	32	(36)	2.17	1.14	58	1	(2)	6	(10)	19	(33)	8	(14)	24	(41)	---
	i.	1.76	1.01	88	1	(1)	3	(3)	21	(24)	12	(14)	51	(58)	2.02	1.15	58	1	(2)	6	(10)	14	(24)	9	(16)	28	(48)	---
	j.	2.38	1.21	88	4	(5)	13	(15)	23	(26)	20	(23)	28	(32)	2.84	1.25	58	5	(9)	14	(24)	18	(31)	9	(16)	12	(21)	---
	k.	3.86	1.04	88	23	(26)	44	(50)	12	(14)	4	(5)	5	(6)	3.97	0.86	58	17	(29)	25	(43)	13	(22)	3	(5)	0	(0)	---

Software

a. Word processing software
b. Spreadsheet
c. Presentation software
d. Online communication software (e.g. E-mail).
e. Online information searching tools (e.g. browser and search engine)
f. Web design/editing software
g. Computer graphic design (e.g. drawing and photo editing software)
h. Multi-media design software (e.g. animation design)
i. Programming (e.g. Logo and Java)
j. Audio/Video editing software (e.g. editing and file format conversion)
k. Chinese input

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.29b Therapists' self-evaluated levels of proficiency in software use ([E8]THQ27a-k)

Therapist types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Highly proficient	Proficient	Quite proficient (基本)	Not proficient	Know nothing at all	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Highly proficient	Proficient	Quite proficient (基本)	Not proficient	Know nothing at all
SPH	a.	4.18	0.87	11	5 (45)	3 (27)	3 (27)	0 (0)	0 (0)	4.11	0.60	9	2 (22)	6 (67)	1 (11)	0 (0)	0 (0)
	b.	3.64	0.67	11	1 (9)	5 (45)	5 (45)	0 (0)	0 (0)	3.44	1.33	9	2 (22)	3 (33)	2 (22)	1 (11)	1 (11)
	c.	4.00	0.89	11	4 (36)	3 (27)	4 (36)	0 (0)	0 (0)	3.89	0.78	9	2 (22)	4 (44)	3 (33)	0 (0)	0 (0)
	d.	4.09	0.83	11	4 (36)	4 (36)	3 (27)	0 (0)	0 (0)	3.89	0.78	9	2 (22)	4 (44)	3 (33)	0 (0)	0 (0)
	e.	4.00	0.89	11	4 (36)	3 (27)	4 (36)	0 (0)	0 (0)	3.89	0.78	9	2 (22)	4 (44)	3 (33)	0 (0)	0 (0)
	f.	2.36	1.03	11	0 (0)	1 (9)	5 (45)	2 (18)	3 (27)	1.56	1.01	9	0 (0)	1 (11)	0 (0)	2 (22)	6 (67)
	g.	3.09	1.04	11	1 (9)	2 (18)	6 (55)	1 (9)	1 (9)	2.44	1.13	9	0 (0)	2 (22)	2 (22)	3 (33)	2 (22)
	h.	2.00	1.10	11	0 (0)	1 (9)	3 (27)	2 (18)	5 (45)	2.22	1.30	9	0 (0)	2 (22)	2 (22)	1 (11)	4 (44)
	i.	1.45	0.82	11	0 (0)	0 (0)	2 (18)	1 (9)	8 (73)	1.11	0.33	9	0 (0)	0 (0)	0 (0)	1 (11)	8 (89)
	j.	2.36	1.21	11	0 (0)	2 (18)	4 (36)	1 (9)	4 (36)	1.89	1.05	9	0 (0)	1 (11)	1 (11)	3 (33)	4 (44)
	k.	3.73	0.90	11	2 (18)	5 (45)	3 (27)	1 (9)	0 (0)	3.78	0.67	9	1 (11)	5 (56)	3 (33)	0 (0)	0 (0)
PHY	a.	4.00	0.63	6	1 (17)	4 (67)	1 (17)	0 (0)	0 (0)	4.14	0.38	7	1 (14)	6 (86)	0 (0)	0 (0)	0 (0)
	b.	3.33	1.37	6	1 (17)	2 (33)	2 (33)	0 (0)	1 (17)	2.86	0.90	7	0 (0)	1 (14)	5 (71)	0 (0)	1 (14)
	c.	3.83	0.75	6	1 (17)	3 (50)	2 (33)	0 (0)	0 (0)	4.14	0.38	7	1 (14)	6 (86)	0 (0)	0 (0)	0 (0)
	d.	4.17	0.75	6	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	4.14	0.38	7	1 (14)	6 (86)	0 (0)	0 (0)	0 (0)
	e.	4.00	0.89	6	2 (33)	2 (33)	2 (33)	0 (0)	0 (0)	4.00	0.58	7	1 (14)	5 (71)	1 (14)	0 (0)	0 (0)
	f.	2.17	1.17	6	0 (0)	1 (17)	1 (17)	2 (33)	2 (33)	1.86	1.07	7	0 (0)	0 (0)	3 (43)	0 (0)	4 (57)
	g.	2.17	1.47	6	0 (0)	2 (33)	0 (0)	1 (17)	3 (50)	2.57	0.79	7	0 (0)	0 (0)	5 (71)	1 (14)	1 (14)
	h.	1.33	0.82	6	0 (0)	0 (0)	1 (17)	0 (0)	5 (83)	2.00	1.00	7	0 (0)	0 (0)	3 (43)	1 (14)	3 (43)
	i.	1.17	0.41	6	0 (0)	0 (0)	0 (0)	1 (17)	5 (83)	1.29	0.76	7	0 (0)	0 (0)	1 (14)	0 (0)	6 (86)
	j.	2.00	1.67	6	1 (17)	0 (0)	1 (17)	0 (0)	4 (67)	2.43	0.98	7	0 (0)	1 (14)	2 (29)	3 (43)	1 (14)
	k.	3.00	1.79	6	2 (33)	0 (0)	2 (33)	0 (0)	2 (33)	3.86	0.38	7	0 (0)	6 (86)	1 (14)	0 (0)	0 (0)
OC	a.	4.00	0.00	7	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	3.73	0.79	11	1 (9)	7 (64)	2 (18)	1 (9)	0 (0)
	b.	3.14	1.07	7	0 (0)	3 (43)	3 (43)	0 (0)	1 (14)	2.73	1.10	11	0 (0)	3 (27)	4 (36)	2 (18)	2 (18)
	c.	4.00	0.00	7	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	3.64	0.81	11	1 (9)	6 (55)	3 (27)	1 (9)	0 (0)
	d.	3.86	0.38	7	0 (0)	6 (86)	1 (14)	0 (0)	0 (0)	3.73	0.65	11	1 (9)	6 (55)	4 (36)	0 (0)	0 (0)
	e.	4.00	0.00	7	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	3.91	0.70	11	2 (18)	6 (55)	3 (27)	0 (0)	0 (0)
	f.	2.57	0.98	7	0 (0)	1 (14)	3 (43)	2 (29)	1 (14)	2.00	1.00	11	0 (0)	1 (9)	2 (18)	4 (36)	4 (36)
	g.	3.14	0.69	7	0 (0)	2 (29)	4 (57)	1 (14)	0 (0)	2.18	1.25	11	0 (0)	2 (18)	3 (27)	1 (9)	5 (45)
	h.	2.14	1.07	7	0 (0)	1 (14)	1 (14)	3 (43)	2 (29)	1.64	1.03	11	0 (0)	1 (9)	1 (9)	2 (18)	7 (64)
	i.	1.71	0.95	7	0 (0)	0 (0)	2 (29)	1 (14)	4 (57)	1.45	0.82	11	0 (0)	0 (0)	2 (18)	1 (9)	8 (73)
	j.	2.14	0.90	7	0 (0)	0 (0)	3 (43)	2 (29)	2 (29)	2.00	1.18	11	0 (0)	2 (18)	1 (9)	3 (27)	5 (45)
	k.	3.43	0.53	7	0 (0)	3 (43)	4 (57)	0 (0)	0 (0)	3.27	0.79	11	0 (0)	5 (45)	4 (36)	2 (18)	0 (0)

Software

a. Word processing software
b. Spreadsheet
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d. Online communication software (e.g. E-mail).
e. Online information searching tools (e.g. browser and search engine)
f. Web design/editing software
g. Computer graphic design (e.g. drawing and photo editing software)
h. Multi-media design software (e.g. animation design)
i. Programming (e.g. Logo and Java)
j. Audio/Video editing software (e.g. editing and file format conversion)
k. Chinese input

Mean: 1="Know nothing at all" and 5="Highly proficient"

Table 8.30a Teachers' self-evaluated levels of proficiency in hardware use ([E5]TQ32a-k)

Special school types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Highly proficient	Proficient	Quite proficient (基本)	Not proficient	Know nothing at all	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Highly proficient	Proficient	Quite proficient (基本)	Not proficient	Know nothing at all	*P*-value
NC	a.	3.98	0.74	103	21 (20)	65 (63)	11 (11)	6 (6)	0 (0)	4.00	0.69	135	28 (21)	82 (61)	23 (17)	1 (1)	1 (1)	0.937
	b.	3.83	0.79	103	17 (17)	60 (58)	18 (17)	8 (8)	0 (0)	3.84	0.82	136	24 (18)	76 (56)	28 (21)	6 (4)	2 (1)	0.966
	c.	3.64	0.98	103	17 (17)	49 (48)	23 (22)	11 (11)	3 (3)	3.73	0.89	135	22 (16)	70 (52)	31 (23)	9 (7)	3 (2)	0.534
	d.	3.34	1.13	103	12 (12)	43 (42)	26 (25)	12 (12)	10 (10)	3.46	1.09	136	17 (13)	64 (47)	31 (23)	13 (10)	11 (8)	0.378
	e.	3.59	0.97	103	17 (17)	44 (43)	27 (26)	13 (13)	2 (2)	3.65	0.96	136	19 (14)	74 (54)	23 (17)	16 (12)	4 (3)	0.512
	f.	2.63	1.40	103	8 (8)	28 (27)	21 (20)	10 (10)	36 (35)	2.55	1.26	136	7 (5)	30 (22)	34 (25)	25 (18)	40 (29)	0.675
	g.	2.51	1.37	103	3 (3)	34 (33)	16 (16)	10 (10)	40 (39)	2.60	1.26	136	5 (4)	35 (26)	38 (28)	17 (13)	41 (30)	0.698
	h.	2.27	1.35	103	6 (6)	17 (17)	24 (23)	8 (8)	48 (47)	2.12	1.30	135	6 (4)	21 (16)	24 (18)	16 (12)	68 (50)	0.418
	i.	2.43	1.38	103	7 (7)	21 (20)	24 (23)	8 (8)	43 (42)	2.49	1.25	135	5 (4)	29 (21)	37 (27)	20 (15)	44 (33)	0.633
	j.	2.75	1.35	102	7 (7)	31 (30)	23 (23)	11 (11)	30 (29)	2.90	1.20	136	12 (9)	34 (25)	41 (30)	27 (20)	22 (16)	0.445
	k.	3.89	0.85	102	23 (23)	52 (51)	22 (22)	3 (3)	2 (2)	3.94	0.82	135	28 (21)	80 (59)	22 (16)	1 (1)	4 (3)	0.597
ID	a.	4.01	0.69	88	20 (23)	50 (57)	17 (19)	1 (1)	0 (0)	3.96	0.73	57	11 (19)	36 (63)	7 (12)	3 (5)	0 (0)	---
	b.	3.85	0.85	88	18 (20)	45 (51)	21 (24)	2 (2)	2 (2)	3.98	0.67	57	12 (21)	32 (56)	13 (23)	0 (0)	0 (0)	---
	c.	3.89	0.79	88	20 (23)	41 (47)	24 (27)	3 (3)	0 (0)	3.95	0.74	57	13 (23)	29 (51)	14 (25)	1 (2)	0 (0)	---
	d.	3.66	0.96	88	17 (19)	35 (40)	27 (31)	7 (8)	2 (2)	3.72	0.84	57	9 (16)	28 (49)	15 (26)	5 (9)	0 (0)	---
	e.	3.82	0.81	88	17 (19)	43 (49)	23 (26)	5 (6)	0 (0)	3.77	0.76	57	8 (14)	31 (54)	15 (26)	3 (5)	0 (0)	---
	f.	2.61	1.26	88	5 (6)	19 (22)	26 (30)	13 (15)	25 (28)	2.75	1.15	57	0 (0)	19 (33)	18 (32)	7 (12)	13 (23)	---
	g.	2.70	1.30	88	5 (6)	24 (27)	24 (27)	10 (11)	25 (28)	2.67	1.23	57	0 (0)	20 (35)	14 (25)	7 (12)	16 (28)	---
	h.	2.42	1.20	88	3 (3)	14 (16)	29 (33)	13 (15)	29 (33)	2.63	1.26	56	1 (2)	17 (30)	15 (27)	6 (11)	17 (30)	---
	i.	2.57	1.26	87	4 (5)	20 (23)	24 (28)	13 (15)	26 (30)	2.84	1.24	57	3 (5)	17 (30)	18 (32)	6 (11)	13 (23)	---
	j.	2.97	1.29	88	11 (13)	21 (24)	27 (31)	12 (14)	17 (19)	3.14	0.85	57	3 (5)	16 (28)	24 (42)	14 (25)	0 (0)	---
	k.	3.94	0.79	88	22 (25)	42 (48)	21 (24)	3 (3)	0 (0)	3.95	0.69	57	11 (19)	33 (58)	12 (21)	1 (2)	0 (0)	---

Hardware

a. Printer
b. CD-ROM (CD-R or DVD-R) Writer
c. Digital Camera
d. Digital Video Recorder
e. Scanner
f. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)]
g. Network Devices (e.g. Domestic Network Devices)
h. Portable Computer Game Devices
i. Portable Multi-media Player Devices
j. LCD Projector
k. Use of Keyboard

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.30b Therapists' self-evaluated levels of proficiency in hardware use ([E8]THQ28a-k)

Therapist types		MS1 Mean (1-5)	MS1 SD	MS1 N	MS1 Count (%) of Teachers choosing the option: Highly proficient	Proficient	Quite proficient (基本)	Not proficient	Know nothing at all	MS2 Mean (1-5)	MS2 SD	MS2 N	MS2 Count (%) of Teachers choosing the option: Highly proficient	Proficient	Quite proficient (基本)	Not proficient	Know nothing at all
SPH	a.	3.91	0.54	11	1 (9)	8 (73)	2 (18)	0 (0)	0 (0)	4.33	0.71	9	4 (44)	4 (44)	1 (11)	0 (0)	0 (0)
	b.	3.73	0.65	11	1 (9)	6 (55)	4 (36)	0 (0)	0 (0)	3.56	0.88	9	1 (11)	4 (44)	3 (33)	1 (11)	0 (0)
	c.	3.91	0.70	11	2 (18)	6 (55)	3 (27)	0 (0)	0 (0)	3.78	0.97	9	2 (22)	4 (44)	2 (22)	1 (11)	0 (0)
	d.	3.64	0.92	11	2 (18)	4 (36)	4 (36)	1 (9)	0 (0)	3.67	1.00	9	2 (22)	3 (33)	3 (33)	1 (11)	0 (0)
	e.	3.45	0.82	11	1 (9)	4 (36)	4 (46)	1 (9)	0 (0)	3.56	0.88	9	1 (11)	4 (44)	3 (33)	1 (11)	0 (0)
	f.	2.55	1.13	11	0 (0)	3 (27)	2 (18)	4 (36)	2 (18)	2.67	1.50	9	1 (11)	2 (22)	2 (22)	1 (11)	3 (33)
	g.	2.18	1.08	11	0 (0)	1 (9)	4 (36)	2 (18)	4 (36)	2.44	1.33	9	0 (0)	3 (33)	1 (11)	2 (22)	3 (33)
	h.	2.00	0.89	11	0 (0)	0 (0)	4 (36)	3 (27)	4 (36)	1.56	0.73	9	0 (0)	0 (0)	1 (11)	3 (33)	5 (56)
	i.	1.91	0.94	11	0 (0)	0 (0)	4 (36)	2 (18)	5 (45)	1.89	1.36	9	1 (11)	0 (0)	1 (11)	2 (22)	5 (56)
	j.	2.45	1.13	11	0 (0)	2 (18)	4 (36)	2 (18)	3 (27)	2.56	1.24	9	1 (11)	0 (0)	4 (44)	2 (22)	2 (22)
	k.	4.09	0.83	11	4 (36)	4 (36)	3 (27)	0 (0)	0 (0)	4.22	0.67	9	3 (33)	5 (56)	1 (11)	0 (0)	0 (0)
PHY	a.	4.17	0.75	6	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	3.86	0.38	7	0 (0)	6 (86)	1 (14)	0 (0)	0 (0)
	b.	3.83	1.17	6	2 (33)	2 (33)	1 (17)	1 (17)	0 (0)	4.00	0.58	7	1 (14)	5 (71)	1 (14)	0 (0)	0 (0)
	c.	3.67	1.21	6	2 (33)	1 (17)	2 (33)	1 (17)	0 (0)	4.29	0.49	7	2 (29)	5 (71)	0 (0)	0 (0)	0 (0)
	d.	3.50	1.22	6	2 (33)	0 (0)	3 (50)	1 (17)	0 (0)	3.71	0.49	7	0 (0)	5 (71)	2 (29)	0 (0)	0 (0)
	e.	3.50	1.05	6	1 (17)	2 (33)	2 (33)	1 (17)	0 (0)	3.57	0.53	7	0 (0)	4 (57)	3 (43)	0 (0)	0 (0)
	f.	2.33	1.75	6	1 (17)	1 (17)	0 (0)	1 (17)	3 (50)	2.57	1.27	7	0 (0)	2 (29)	2 (29)	1 (14)	2 (29)
	g.	2.50	1.97	6	2 (33)	0 (0)	0 (0)	1 (17)	3 (50)	2.86	1.57	7	1 (14)	2 (29)	1 (14)	1 (14)	2 (29)
	h.	2.00	0.63	6	0 (0)	0 (0)	1 (17)	4 (67)	1 (17)	2.57	1.27	7	0 (0)	2 (29)	2 (29)	1 (14)	2 (29)
	i.	1.83	0.98	6	0 (0)	0 (0)	2 (33)	1 (17)	3 (50)	2.86	1.35	7	0 (0)	3 (43)	2 (29)	0 (0)	2 (29)
	j.	2.17	0.98	6	0 (0)	0 (0)	3 (50)	1 (17)	2 (33)	2.43	1.13	7	0 (0)	1 (14)	3 (43)	1 (14)	2 (29)
	k.	4.00	0.89	6	2 (33)	2 (33)	2 (33)	0 (0)	0 (0)	4.14	0.38	7	1 (14)	6 (86)	0 (0)	0 (0)	0 (0)
OC	a.	3.86	0.38	7	0 (0)	6 (86)	1 (14)	0 (0)	0 (0)	3.82	0.60	11	1 (9)	7 (64)	3 (27)	0 (0)	0 (0)
	b.	3.86	0.38	7	0 (0)	6 (86)	1 (14)	0 (0)	0 (0)	3.73	0.79	11	2 (18)	4 (36)	5 (45)	0 (0)	0 (0)
	c.	4.00	0.00	7	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	3.64	0.92	11	2 (18)	4 (36)	4 (36)	1 (9)	0 (0)
	d.	4.00	0.00	7	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	3.18	1.25	11	2 (18)	2 (18)	4 (36)	2 (18)	1 (9)
	e.	3.86	0.38	7	0 (0)	6 (86)	1 (14)	0 (0)	0 (0)	3.27	1.01	11	2 (18)	1 (9)	6 (55)	2 (18)	0 (0)
	f.	3.43	0.53	7	0 (0)	3 (43)	4 (57)	0 (0)	0 (0)	2.27	1.19	11	1 (9)	0 (0)	3 (27)	4 (36)	3 (27)
	g.	3.43	1.13	7	0 (0)	5 (71)	1 (14)	0 (0)	1 (14)	3.27	1.27	11	2 (18)	3 (27)	3 (27)	2 (18)	1 (9)
	h.	3.29	1.11	7	0 (0)	4 (57)	2 (29)	0 (0)	1 (14)	2.09	0.94	11	0 (0)	0 (0)	5 (45)	2 (18)	4 (36)
	i.	3.29	1.11	7	0 (0)	4 (57)	2 (29)	0 (0)	1 (14)	2.64	1.21	11	1 (9)	1 (9)	4 (36)	3 (27)	2 (18)
	j.	3.14	1.07	7	0 (0)	3 (43)	3 (43)	0 (0)	1 (14)	2.45	1.04	11	0 (0)	1 (9)	6 (55)	1 (9)	3 (27)
	k.	4.00	0.00	7	0 (0)	7 (100)	0 (0)	0 (0)	0 (0)	3.91	0.70	11	2 (18)	6 (55)	3 (27)	0 (0)	0 (0)

Hardware

a. Printer
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d. Digital Video Recorder
e. Scanner
f. Mobile Devices [e.g. Pocket Personal Computer (PC) or Personal Digital Assistant (PDA)]
g. Network Devices (e.g. Domestic Network Devices)
h. Portable Computer Game Devices
i. Portable Multi-media Player Devices
j. LCD Projector
k. Use of Keyboard

Mean: 1="Know nothing at all" and 5="Highly proficient"

8.2.2 Perceived Application of IT in Teaching

School heads were satisfied with teachers' use of IT in daily teaching and learning management as well as in promoting students to learn subject knowledge of different KLAs

Table 8.31 ([E1]HSQ2e-k,3b) shows the satisfaction levels of school heads with respect to the teachers' use of IT in teaching. In MS1, 92% of the respondents were satisfied or very satisfied with teachers' use of IT in daily teaching and learning management. 83% of them were satisfied or very satisfied that teachers could use IT to promote students to learn subject knowledge of different KLAs. As for the other outcomes of empowering teachers with IT, around two-thirds of the respondents were satisfied or very satisfied with the following outcomes: the opportunities created by teachers to encourage students to develop their learning ability with the use of IT, and to foster students' positive attitude and value of using IT (67%), teachers' use of IT to monitor and assess the performance of students (67%), teachers' use of IT to collate information on students' progress in learning so as to tailor for individual differences through learning activities (65%) and teachers' use of IT in providing students with the opportunities to learn in various cross-subject learning activities (61%). A relatively smaller proportion of school heads were satisfied or very satisfied that teachers could use IT to create the opportunities for students to work collaboratively (56%) and a learning environment to support students' active independent learning (45%), with mean ratings fell in the range of 3.39 to 4.28 (SD:0.56-0.80) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was observed in school heads' level of satisfaction with teachers' use of IT in teaching in MS2.

Teachers perceived a higher level of agreement that they used IT to motivate students in the learning of key learning areas as well as provided opportunities for students to acquire IT knowledge and skills, but they perceived a lower level of agreement that they used IT for monitoring and assessment of students' performance and learning progress

When special school teachers were asked about their perceived application of IT into different learning and teaching tasks, (Table 8.32, [E5]TQ30a-h), around two-thirds of the teachers agreed or strongly agreed that they used IT to achieve learning outcomes, such as providing the opportunities for students to acquire IT knowledge and skills (NC=MS1=MS2: 62%; ID=MS1: 59%, MS2: 62%) and using IT to motivate students in the learning of respective KLAs (NC=MS1=MS2: 56%; ID=MS1: 66%, MS2: 67%). 53% and 55% of NC as well as 52% and 47% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that they facilitated students to use IT in cross-curricular learning activities. In addition, 52% and 49% of NC as well as 45% and 39% of ID teachers in MS1 and MS2 respectively were agreed or strongly agreed that they created opportunities to encourage students to develop their learning ability with the use of IT and to foster positive attitude and value in using IT. 40% to 55% of the surveyed teachers agreed or strongly agreed that they created a supportive learning environment for students' active independent learning (NC=MS1: 55%, MS2: 49%; ID=MS1: 46%, MS2: 42%) and made use of IT to create the opportunities for students to work collaboratively (NC=MS1: 40%, MS2: 45%; ID=MS1: 43%, MS2: 40%). 41% and 42% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that they applied IT for monitoring and assessment of students' performance as well as to encourage students' continuous improvement. 51% and 50% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that they used IT as a tool in collating information on students' progress in learning so that learning activities could be designed to cater for individual learning differences. On the other hand, only 28% and 26% of NC teachers in MS1 as well as 30% and 34% of NC teachers in MS2 respectively agreed or strongly agreed that they made effective use of IT to achieve these two learning outcomes respectively, with mean ratings below 3.10 on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. No statistically significant difference was observed in all items for NC teachers in MS2.

Table 8.31 School heads' levels of satisfaction with teachers' use of IT in teaching ([E1-1/E1-2]HSQ2e-k,3b)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied	
2e.	4.28	0.60	54	19	(35)	31	(57)	4	(7)	0 (0)	4.19	0.56	52	14	(27)	34	(65)	4	(8)	0 (0)	0.419
2f.	3.91	0.56	54	5	(9)	40	(74)	8	(15)	1 (2)	3.81	0.66	52	6	(12)	31	(60)	14	(27)	1 (2)	0.339
2g.	3.69	0.58	54	2	(4)	34	(63)	17	(31)	1 (2)	3.77	0.55	52	3	(6)	34	(65)	15	(29)	0 (0)	0.511
2h.	3.63	0.73	54	3	(6)	33	(61)	13	(24)	5 (9)	3.67	0.65	52	4	(8)	28	(54)	19	(37)	1 (2)	0.960
2i.	3.65	0.80	54	5	(9)	30	(56)	15	(28)	3 (6)	3.87	0.71	52	8	(15)	31	(60)	11	(21)	2 (4)	0.170
2j.	3.39	0.74	54	2	(4)	22	(41)	26	(48)	3 (6)	3.52	0.67	52	3	(6)	23	(44)	24	(46)	2 (4)	0.438
2k.	3.50	0.69	54	1	(2)	29	(54)	21	(39)	2 (4)	3.48	0.75	52	3	(6)	24	(46)	20	(38)	5 (10)	0.782
3b	3.63	0.59	54	2	(4)	31	(57)	20	(37)	1 (2)	3.71	0.67	52	4	(8)	31	(60)	15	(29)	2 (4)	0.446

Aspects related to teachers' application of ITEd

2e. Teachers can use IT in their daily teaching and learning management.
2f. Teachers can use IT to promote students in learning the subject knowledge of different key learning areas (KLAs) (e.g. to establish the context for learning and to explain abstract concepts).
2g. Teachers can create opportunities to encourage students to develop their learning ability with the use of IT, and to foster students' positive attitude and value of using IT.
2h. Teachers can use IT to monitor and to assess the performance of students so as to encourage students' continuous improvement.
2i. Teachers use IT to collate information on students' progress in learning so that learning activities can be designed to cater for individual needs.
2j. Teachers can use IT to create a learning environment to support students' active independent learning.
2k. Teachers can use IT to create opportunities for students to work collaboratively.
3b. Teachers can provide students the opportunity to use IT in various cross-subject learning activities.
Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.32 Teachers' levels of agreement on their cognition and application of ITEd ([E5]TQ30a-h)

Special school types		MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
					Strongly agree		Agree		Neutral		Disagree				Strongly agree		Agree		Neutral		Disagree	
NC	a.	3.47	0.78	101	3	(3)	54	(53)	33	(33)	9 (9)	3.53	0.72	135	6	(4)	70	(52)	49	(36)	9 (7)	0.738
	b.	3.49	0.70	102	4	(4)	49	(48)	43	(42)	5 (5)	3.40	0.76	135	3	(2)	64	(47)	55	(41)	10 (7)	0.483
	c.	2.95	0.89	102	1	(1)	28	(27)	45	(44)	21 (21)	3.07	0.83	135	3	(2)	38	(28)	63	(47)	27 (20)	0.421
	d.	2.91	0.89	102	2	(2)	24	(24)	45	(44)	25 (25)	3.08	0.86	135	2	(1)	45	(33)	54	(40)	30 (22)	0.137
	e.	3.60	0.68	101	4	(4)	59	(58)	33	(33)	4 (4)	3.53	0.76	135	4	(3)	79	(59)	38	(28)	12 (9)	0.606
	f.	3.39	0.80	102	2	(2)	52	(51)	34	(33)	12 (12)	3.44	0.83	135	5	(4)	69	(51)	45	(33)	12 (9)	0.642
	g.	3.44	0.75	102	2	(2)	54	(53)	34	(33)	11 (11)	3.37	0.80	135	3	(2)	64	(47)	52	(39)	12 (9)	0.498
	h.	3.16	0.85	102	1	(1)	40	(39)	38	(37)	20 (20)	3.28	0.83	135	3	(2)	58	(43)	52	(39)	18 (13)	0.267
ID	a.	3.63	0.65	88	2	(2)	56	(64)	26	(30)	3 (3)	3.72	0.62	58	4	(7)	35	(60)	18	(31)	1 (2)	---
	b.	3.40	0.65	88	1	(1)	39	(44)	43	(49)	4 (5)	3.36	0.72	58	3	(5)	20	(34)	30	(52)	5 (9)	---
	c.	3.28	0.77	88	2	(2)	34	(39)	41	(47)	9 (10)	3.28	0.80	57	1	(2)	23	(40)	26	(46)	5 (9)	---
	d.	3.40	0.74	88	1	(1)	44	(50)	33	(38)	9 (10)	3.33	0.85	58	1	(2)	28	(48)	20	(34)	7 (12)	---
	e.	3.57	0.54	88	0	(0)	52	(59)	34	(39)	2 (2)	3.64	0.52	58	1	(2)	35	(60)	22	(38)	0 (0)	---
	f.	3.45	0.66	88	1	(1)	45	(51)	35	(40)	7 (8)	3.40	0.67	58	1	(2)	26	(45)	26	(45)	5 (9)	---
	g.	3.38	0.68	88	1	(1)	40	(45)	38	(43)	9 (10)	3.34	0.66	58	1	(2)	23	(40)	29	(50)	5 (9)	---
	h.	3.35	0.63	88	0	(0)	38	(43)	43	(49)	7 (8)	3.26	0.76	58	1	(2)	22	(38)	27	(47)	7 (12)	---

Teachers' cognition and application of ITEd

a. You have used IT to motivate students in the learning of respective Key Learning Areas (KLAs) (e.g. to establish the learning context and to explain abstract concepts).
b. You have created opportunities to encourage students to develop their learning ability with the use of IT, and to foster positive attitude and value in using IT.
c. You have used IT to monitor and assess the performance of students as well as to encourage students' continuous improvement.
d. You have used IT as a tool to collate information on students' progress in learning so that learning activities can be designed to cater for individual learning differences.
e. You have provided opportunities for students to acquire IT knowledge and skills.
f. You have facilitated students to use IT in cross-curricular learning activities.
g. You have used IT to create a supportive learning environment for students' active independent learning.
h. You have used IT to create opportunities for students to work collaboratively.
Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.2.3 Belief and Attitude towards Using IT for Learning and Teaching

Teachers perceived the highest level of agreement that the use of IT could enhance teaching effectiveness, but they perceived a lower level of agreement that it could strengthen the relationship between teachers and students

Teachers' belief and attitude towards using IT for teaching were examined by asking the surveyed teachers to indicate their levels of agreement to a number of benefits about using IT for teaching. Majority of the teachers (NC=MS1: 82%, MS2: 81%; ID=MS1: 80%, MS2: 82%) agreed or strongly agreed that IT could enhance teaching effectiveness. About 39% to 50% of the teachers agreed or strongly agreed to other benefits of using IT: time saving and convenience (NC=MS1: 43%, MS2: 49%; ID=MS1: 42%, MS2: 46%), facilitating assessment and evaluation of students' learning progress (NC=MS1: 39%, MS2: 45%; ID=MS1: 47%, MS2: 44%), providing immediate feedback to students in their learning (NC=MS1: 48%, MS2: 50%; ID=MS1: 50%, MS2: 48%) and facilitating effective planning and management of teaching process (NC=MS1: 50%, MS2: 55%; ID=MS1=MS2: 50%). With regard to strengthening the relationship between teachers and students, the lowest level of agreement was received (NC=MS1: 41%, MS2: 44%; ID=MS1: 31%, MS2: 32%) (Table 8.33a, [E5]TQ16a-f). With respect to the teachers' perception of difficulties or obstacles in using IT for teaching, 53% and 57% of NC as well as 42% and 39% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that the use of IT increased teaching workload. 49% and 51% of NC as well as 33% and 34% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that the design of general classrooms was unsuitable for the use of IT in teaching. 36% and 39% of NC as well as 23% and 26% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that their schools lacked concrete and effective schemes to promote ITEd. 28% and 32% of NC as well as 23% and 27% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that students' concentration would be distracted when using computers for individual or small-group learning (Table 8.33a, [E5]TQ16g-j). No statistically significant difference was observed in all items of NC teachers in MS2.

Therapists indicated different perspectives regarding the benefits of using IT in therapy or training. 55% and 67% of SPH (n=6) in MS1 and MS2 respectively as well as 67% of PHY therapists (n=4) in MS1 agreed that IT could facilitate effective planning and management of therapy or training process. 85% of OC (n=6) in MS1 and 57% of PHY therapists (n=4) in MS2 agreed or strongly agreed that IT could facilitate the assessment and evaluation of students' therapy or training process while 82% of OC in MS2 agreed or strongly agreed that therapy/training effectiveness was enhanced with the use of IT. On the other hand, 18% and 22% of SPH (n=2) in MS1 and MS2 respectively as well as 28% of OC therapists (n=2) in MS1 agreed or strongly agreed that it could strengthen the relationship between therapists and students. 17% and 14% of PHY therapists (n=1) in MS1 and MS2 respectively agreed that the use of IT assisted them in providing immediate feedback to students in their therapy or training (Table 8.33b, [E8]THQ15a-f). With respect to the difficulties or obstacles in using IT in therapy or training, 45% (n=5) and 44% (n=4) of SPH, 67% and 58% of PHY (n=4) as well as 58% (n=4) and 64% (n=7) of OC therapists in MS1 and MS2 respectively agreed or strongly agreed that the design of general therapy/training site was unsuitable for the use of IT in therapy or training. 57% of OC (n=4) in MS1 and 55% of SPH therapists (n=5) in MS2 agreed or strongly agreed that their schools lacked concrete and effective schemes to promote IT in therapy or training. 72% of PHY therapists (n=5) in MS2 agreed or strongly agreed that the use of IT increased therapy/training workload (Table 8.33b, [E8]THQ15g-j).

Teachers tended to be willing to allocate more time to apply IT in teaching

Teachers'/Therapists' belief and attitude towards using IT for learning and teaching/therapy or training could also be reflected by their willingness to allocate more time to apply IT in teaching/therapy or training. In MS1, 54% of NC and 42% of ID teachers were willing or very willing to allocate more time to apply IT in teaching, with mean ratings of 3.49 (SD:0.70) and 3.41 (SD:0.60) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. A statistically significant decrease was noted in the percentage of NC teachers rating themselves as willing or very willing to allocate more time to apply IT in teaching (from 54% to 39%) in MS2. 46% of ID teachers in MS2 were willing or very willing to do so (Table 8.34a, [E5]TQ20).

As for therapists, 36% of SPH (n=4) and 43% of OC therapists (n=3) in MS1 were willing or very willing to allocate more time to apply IT in therapy or training, with mean ratings of 3.00 (SD:1.26) and 3.43 (SD:0.53) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. All PHY therapists (n=6) in MS1 were neutral to this item. In MS2, 13% (n=1), 14% (n=1) and 64% (n=7) of SPH, PHY and OC therapists respectively willing to do so (Table 8.34b, [E8]THQ18).

8.2.4 Teaching with IT

Teachers adopted IT more frequently in General Studies and Chinese Language

When asked to rate the extent to which IT had been adopted in class, the two subjects that computers had been used the most frequently in teaching were "General Studies" (MS1=MS2=16%) and "Chinese Language" (MS1: 14%, MS2: 18%). The other more frequently reported subjects were "Computer Studies" (MS1=MS2=10%), "English Language" (MS1: 9%, MS2: 13%) and "Mathematics" (MS1: 8%, MS2: 10%). Teachers in different special school types indicated computers were used the most frequently in different subjects while teaching. "Chinese Language" was the most frequently reported subject by 20% of H, 50% of HI and 19% of ID-M teachers in MS1 as well as around 20% of H, SSD, HI, ID-S and PD teachers in MS2. "General Studies" was the most frequently reported subject by 26% of ID-Mmod and 47% of ID-Mod teachers in MS1 as well as 22% of H, 23% of ID-Mmod and 56% of ID-Mod teachers in MS2. "Computer Studies" was the most frequently reported subject by 33% of PD in MS1 and 17% of VI in MS2; "Communications" by 31% and 20% of ID-S in MS1 and MS2 respectively; "Social Studies" by 17% of SSD and HI in MS1; "English Language" by 18% of VI and H teachers in MS1. These figures must be interpreted with caution due to the small sample size (Table 8.35, [E5]TQ2).

Table 8.33a Teachers' levels of agreement on the aspects related to the use of IT in teaching ([E5]TQ16a-j)

Special school types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	*P*-value
NC	a.	3.86	0.51	103	6 (6)	78 (76)	18 (17)	1 (1)	0 (0)	3.90	0.64	136	16 (12)	94 (69)	23 (17)	2 (1)	1 (1)	0.504
	b.	3.22	0.88	103	3 (3)	41 (40)	39 (38)	16 (16)	4 (4)	3.34	0.93	136	9 (7)	57 (42)	45 (33)	19 (14)	5 (4)	0.304
	c.	3.28	0.69	103	1 (1)	39 (38)	52 (50)	10 (10)	1 (1)	3.37	0.77	136	6 (4)	55 (41)	58 (43)	15 (11)	1 (1)	0.365
	d.	3.44	0.67	103	2 (2)	47 (46)	50 (49)	2 (2)	2 (2)	3.42	0.78	136	6 (4)	61 (46)	51 (38)	15 (11)	1 (1)	0.939
	e.	3.43	0.74	103	3 (3)	48 (47)	44 (43)	6 (6)	2 (2)	3.47	0.80	136	6 (4)	69 (51)	46 (34)	11 (8)	3 (2)	0.479
	f.	3.19	0.83	103	1 (1)	41 (40)	41 (40)	17 (17)	3 (3)	3.32	0.83	136	6 (4)	54 (40)	55 (41)	17 (13)	3 (2)	0.317
	g.	3.03	0.87	103	5 (5)	24 (23)	44 (43)	29 (28)	1 (1)	3.08	0.83	136	3 (2)	41 (30)	57 (42)	32 (24)	2 (1)	0.498
	h.	3.55	0.82	103	11 (11)	43 (42)	40 (39)	7 (7)	1 (1)	3.56	0.77	136	11 (8)	66 (49)	47 (35)	12 (9)	0 (0)	0.865
	i.	3.50	0.91	103	15 (15)	35 (34)	41 (40)	11 (11)	1 (1)	3.45	0.88	136	13 (10)	56 (41)	47 (35)	19 (14)	1 (1)	0.744
	j.	3.27	0.82	103	7 (7)	30 (29)	51 (50)	14 (14)	1 (1)	3.32	0.85	136	11 (8)	42 (31)	64 (47)	17 (13)	2 (1)	0.652
ID	a.	3.91	0.54	88	9 (10)	62 (70)	17 (19)	0 (0)	0 (0)	3.95	0.57	59	8 (14)	40 (68)	11 (19)	0 (0)	0 (0)	---
	b.	3.23	0.77	88	0 (0)	37 (42)	35 (40)	15 (17)	1 (1)	3.29	0.81	59	1 (2)	26 (44)	22 (37)	9 (15)	1 (2)	---
	c.	3.43	0.69	88	3 (3)	39 (44)	39 (44)	7 (8)	0 (0)	3.37	0.74	59	2 (3)	24 (41)	28 (47)	4 (7)	1 (2)	---
	d.	3.49	0.66	88	3 (3)	41 (47)	41 (47)	2 (2)	1 (1)	3.47	0.75	59	4 (7)	24 (41)	28 (47)	2 (3)	1 (2)	---
	e.	3.42	0.69	88	1 (1)	43 (49)	37 (42)	6 (7)	1 (1)	3.49	0.65	59	2 (3)	28 (47)	26 (44)	3 (5)	0 (0)	---
	f.	3.17	0.79	88	3 (3)	25 (28)	46 (52)	12 (14)	2 (2)	3.22	0.77	59	3 (5)	16 (27)	31 (53)	9 (15)	0 (0)	---
	g.	2.99	0.75	88	1 (1)	19 (22)	47 (54)	18 (21)	2 (2)	3.05	0.80	59	2 (3)	14 (24)	28 (47)	15 (25)	0 (0)	---
	h.	3.31	0.75	88	2 (2)	35 (40)	39 (45)	10 (11)	1 (1)	3.28	0.79	59	2 (3)	21 (36)	27 (47)	7 (12)	1 (2)	---
	i.	3.14	0.90	88	6 (7)	23 (26)	37 (42)	21 (24)	1 (1)	3.12	0.93	59	4 (7)	16 (27)	23 (39)	15 (25)	1 (2)	---
	j.	3.02	0.79	88	3 (3)	18 (20)	46 (52)	20 (23)	1 (1)	3.07	0.87	59	4 (7)	11 (19)	30 (51)	13 (22)	1 (2)	---

Aspects related to the use of IT in teaching

a. Teaching effectiveness is enhanced with the use of IT
b. It saves time and is convenient to use IT
c. The use of IT facilitates the assessment and evaluation of students' learning progress
d. The use of IT can provide immediate feedback to students in their learning
e. The use of IT facilitates effective planning and management of teaching process
f. The use of IT can strengthen the relationship between teachers and students
g. Students' concentration will be distracted when using computers for individual or small-group learning
h. The use of IT increases teaching workload
i. The design of general classrooms is unsuitable for the use of IT in teaching
j. The school is in lack of concrete and effective scheme to promote ITEd

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.34a Teachers' levels of willingness to allocate more time to apply IT in teaching ([E5]TQ20)

	MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	*P*-value
NC	3.49	0.70	102	3 (3)	52 (51)	40 (39)	6 (6)	1 (1)	3.32	0.68	135	2 (1)	51 (38)	72 (53)	8 (6)	2 (1)	0.037*
ID	3.41	0.60	86	2 (2)	34 (40)	47 (55)	3 (3)	0 (0)	3.47	0.63	58	2 (3)	25 (43)	29 (50)	2 (3)	0 (0)	---

Mean: 1="Totally not willing" and 5="Very willing"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

Table 8.33b Therapists' levels of agreement on the aspects related to the use of IT in therapy/training ([E8]THQ15a-j)

Therapist types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree
SPH	a.	2.91	1.14	11	0 (0)	4 (36)	4 (36)	1 (9)	2 (18)	3.56	0.53	9	0 (0)	5 (56)	4 (44)	0 (0)	0 (0)
	b.	2.82	1.25	11	0 (0)	4 (36)	4 (36)	0 (0)	3 (27)	3.11	1.05	9	1 (11)	2 (22)	3 (33)	3 (33)	0 (0)
	c.	2.82	1.25	11	0 (0)	4 (36)	4 (36)	0 (0)	3 (27)	3.22	1.09	9	1 (11)	3 (33)	2 (22)	3 (33)	0 (0)
	d.	2.73	1.19	11	0 (0)	3 (27)	5 (45)	0 (0)	3 (27)	3.56	0.88	9	1 (11)	4 (44)	3 (33)	1 (11)	0 (0)
	e.	3.36	0.92	11	0 (0)	6 (55)	4 (36)	0 (0)	1 (9)	3.67	0.87	9	1 (11)	5 (56)	2 (22)	1 (11)	0 (0)
	f.	2.64	1.12	11	0 (0)	2 (18)	6 (55)	0 (0)	3 (27)	2.89	0.78	9	0 (0)	2 (22)	4 (44)	3 (33)	0 (0)
	g.	3.00	0.45	11	0 (0)	1 (9)	9 (82)	1 (9)	0 (0)	3.11	0.78	9	0 (0)	3 (33)	4 (44)	2 (22)	0 (0)
	h.	3.00	0.77	11	1 (9)	0 (0)	8 (73)	2 (18)	0 (0)	3.56	0.73	9	1 (11)	3 (33)	5 (56)	0 (0)	0 (0)
	i.	3.55	0.93	11	2 (18)	3 (27)	5 (45)	1 (9)	0 (0)	3.44	0.53	9	0 (0)	4 (44)	5 (56)	0 (0)	0 (0)
	j.	3.09	0.70	11	1 (9)	0 (0)	9 (82)	1 (9)	0 (0)	3.56	0.88	9	1 (11)	4 (44)	3 (33)	1 (11)	0 (0)
PHY	a.	3.33	0.82	6	0 (0)	3 (50)	2 (33)	1 (17)	0 (0)	2.86	0.69	7	0 (0)	1 (14)	4 (57)	2 (29)	0 (0)
	b.	2.83	1.47	6	1 (17)	1 (17)	1 (17)	2 (33)	1 (17)	2.29	0.76	7	0 (0)	0 (0)	3 (43)	3 (43)	1 (14)
	c.	3.67	0.82	6	1 (17)	2 (33)	3 (50)	0 (0)	0 (0)	3.43	1.27	7	1 (14)	3 (43)	2 (29)	0 (0)	1 (14)
	d.	3.00	0.63	6	0 (0)	1 (17)	4 (67)	1 (17)	0 (0)	2.86	0.90	7	0 (0)	1 (14)	5 (71)	0 (0)	1 (14)
	e.	3.67	0.52	6	0 (0)	4 (67)	2 (33)	0 (0)	0 (0)	3.29	0.95	7	1 (14)	1 (14)	4 (57)	1 (14)	0 (0)
	f.	3.17	0.98	6	0 (0)	3 (50)	1 (17)	2 (33)	0 (0)	3.14	1.07	7	1 (14)	1 (14)	3 (43)	2 (29)	0 (0)
	g.	2.83	0.75	6	0 (0)	1 (17)	3 (50)	2 (33)	0 (0)	3.29	0.76	7	0 (0)	3 (43)	3 (43)	1 (14)	0 (0)
	h.	3.33	0.52	6	0 (0)	2 (33)	4 (67)	0 (0)	0 (0)	4.00	0.82	7	2 (29)	3 (43)	2 (29)	0 (0)	0 (0)
	i.	4.17	0.98	6	3 (50)	1 (17)	2 (33)	0 (0)	0 (0)	3.71	1.11	7	2 (29)	2 (29)	2 (29)	1 (14)	0 (0)
	j.	3.50	0.84	6	1 (17)	1 (17)	4 (67)	0 (0)	0 (0)	3.00	0.58	7	0 (0)	1 (14)	5 (71)	1 (14)	0 (0)
OC	a.	3.71	0.76	7	1 (14)	3 (43)	3 (43)	0 (0)	0 (0)	3.91	0.54	11	1 (9)	8 (73)	2 (18)	0 (0)	0 (0)
	b.	3.29	1.11	7	1 (14)	2 (29)	2 (29)	2 (29)	0 (0)	3.73	0.65	11	1 (9)	6 (55)	4 (36)	0 (0)	0 (0)
	c.	3.86	0.90	7	1 (14)	5 (71)	0 (0)	1 (14)	0 (0)	3.55	0.69	11	0 (0)	7 (64)	3 (27)	1 (9)	0 (0)
	d.	3.71	0.76	7	1 (14)	3 (43)	3 (43)	0 (0)	0 (0)	3.55	0.69	11	0 (0)	7 (64)	3 (27)	1 (9)	0 (0)
	e.	3.71	0.76	7	1 (14)	3 (43)	3 (43)	0 (0)	0 (0)	3.55	0.52	11	0 (0)	6 (55)	5 (45)	0 (0)	0 (0)
	f.	3.29	0.95	7	1 (14)	1 (14)	4 (57)	1 (14)	0 (0)	3.55	0.52	11	0 (0)	6 (55)	5 (45)	0 (0)	0 (0)
	g.	3.29	0.49	7	0 (0)	2 (29)	5 (71)	0 (0)	0 (0)	3.09	0.70	11	0 (0)	3 (27)	6 (55)	2 (18)	0 (0)
	h.	3.43	0.79	7	1 (14)	1 (14)	5 (71)	0 (0)	0 (0)	3.45	0.52	11	0 (0)	5 (45)	6 (55)	0 (0)	0 (0)
	i.	3.86	0.90	7	2 (29)	2 (29)	3 (43)	0 (0)	0 (0)	3.45	0.82	11	0 (0)	7 (64)	2 (18)	2 (18)	0 (0)
	j.	3.71	0.76	7	1 (14)	3 (43)	3 (43)	0 (0)	0 (0)	3.45	0.69	11	0 (0)	6 (55)	4 (36)	1 (9)	0 (0)

Aspects related to the use of IT in therapy/training

a. Therapy/training effectiveness is enhanced with the use of IT
b. The use of IT in therapy/training is convenient and saves times
c. The use of IT facilitates the assessment and evaluation of students' therapy/training process
d.. The use of IT can provide immediate feedback to students in their therapy/training
e. The use of IT facilitates effective planning and management of therapy/training process
f. The use of IT can strengthen the relationship between therapists and students
g. Students' concentration will be distracted when using computers for individual or small-group therapy/training
h. The use of IT increases therapy/training workload
i. The design of general therapy/training site is unsuitable for the use of IT in therapy/training
j. The school is in lack of concrete and effective scheme to promote IT in therapy/training

Mean: 1="Strongly disagree" and 5="Strongly agree"

Table 8.34b Therapists' levels of willingness to allocate more time to apply IT in therapy/training ([E8]THQ18)

Therapist types	MS1 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	MS2 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing
SPH	3.00	1.26	11	1 (9)	3 (27)	4 (36)	1 (9)	2 (18)	3.13	0.35	8	0 (0)	1 (13)	7 (88)	0 (0)	0 (0)
PHY	3.00	0.00	6	0 (0)	0 (0)	6 (100)	0 (0)	0 (0)	2.86	0.69	7	0 (0)	1 (14)	4 (57)	2 (29)	0 (0)
OC	3.43	0.53	7	0 (0)	3 (43)	4 (57)	0 (0)	0 (0)	3.55	0.69	11	0 (0)	7 (64)	3 (27)	1 (9)	0 (0)

Mean: 1="Totally not willing" and 5="Very willing"

Table 8.35 The subjects which teachers used computers the most frequently in teaching after the commencement of the 2005/06 school year ([E5]TQ2)

Subjects	MS1 Overall (N=191)		H (N=51)		SSD (N=18)		VI (N=22)		HI (N=6)		ID-M (N=26)		ID-Mmod (N=34)		ID-Mod (N=15)		ID-S (N=13)		PD (N=6)	
	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%
Chinese Language	26	14	10	20	0	0	2	9	3	50	5	19	5	15	0	0	0	0	1	17
English Language	17	9	9	18	2	11	4	18	1	17	0	0	0	0	0	0	0	0	1	17
Mathematics	16	8	7	14	1	6	1	5	0	0	2	8	4	12	0	0	0	0	1	17
General Studies	31	16	7	14	0	0	3	14	0	0	4	15	9	26	7	47	1	8	0	0
Chinese History	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
History	1	1	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0
Putonghua	2	1	0	0	1	6	0	0	0	0	1	4	0	0	0	0	0	0	0	0
Economics and Public Affairs	1	1	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0
Social Studies	5	3	1	2	3	17	0	0	1	17	0	0	0	0	0	0	0	0	0	0
Civil Education	5	3	3	6	2	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Geography	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Integrated Science	5	3	3	6	1	6	0	0	0	0	0	0	0	0	1	7	0	0	0	0
Biology	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Computer Studies	20	10	5	10	1	6	2	9	1	17	4	15	5	15	0	0	0	0	2	33
Commerce	1	1	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accounting	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communications	5	3	0	0	0	0	0	0	0	0	0	0	0	0	1	7	4	31	0	0
Personal and Social Education	4	2	0	0	1	6	0	0	0	0	0	0	0	0	0	0	3	23	0	0
Perceptual Motor Training	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Self-Care	2	1	0	0	0	0	0	0	0	0	0	0	1	3	1	7	0	0	0	0
Independent Living Skills	5	3	0	0	0	0	1	5	0	0	0	0	3	9	1	7	0	0	0	0
Physical Training	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily Living Training	2	1	0	0	0	0	1	5	0	0	0	0	0	0	0	0	1	8	0	0
Informal Prevocational Training	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electronic Engineering	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technical Drawing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Repair	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Visual Arts	6	3	1	2	1	6	0	0	0	0	1	4	1	3	0	0	2	15	0	0
Music	6	3	2	4	0	0	0	0	0	0	2	8	2	6	0	0	0	0	0	0
Home Economics	1	1	0	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Art and Craft	2	1	0	0	0	0	1	5	0	0	0	0	0	0	0	0	1	8	0	0
Design and Technology	1	1	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0
Art and Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Physical Education	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Religious Studies	3	2	0	0	1	6	0	0	0	0	2	8	0	0	0	0	0	0	0	0
Others (Please specify):	24	13	3	6	2	11	5	23	0	0	4	15	4	12	4	27	1	8	1	17

Table 8.35 The subjects which teachers used computers the most frequently in teaching after the commencement of the 2005/06 school year ([E5]TQ2) (Continued)

Subjects which computer was used the most frequently	MS2 Overall (N=195)		H (N=51)		SSD (N=15)		VI (N=18)		HI (N=19)		ID-M (N=0)		ID-Mmod (N=40)		ID-Mod (N=9)		ID-S (N=10)		PD (N=33)	
	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%	C	%
Chinese Language	36	18	11	22	3	20	2	11	4	21	-	-	5	13	1	11	2	20	8	24
English Language	26	13	7	14	3	20	2	11	3	16	-	-	6	15	0	0	0	0	5	15
Mathematics	20	10	7	14	3	20	1	6	3	16	-	-	0	0	1	11	0	0	5	15
General Studies	31	16	11	22	1	7	2	11	0	0	-	-	9	23	5	56	1	10	2	6
Chinese History	1	1	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	1	3
History	1	1	0	0	0	0	1	6	0	0	-	-	0	0	0	0	0	0	0	0
Putonghua	1	1	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	1	3
Economics and Public Affairs	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Social Studies	3	2	0	0	0	0	0	0	0	0	-	-	1	3	0	0	0	0	2	6
Civil Education	3	2	1	2	0	0	0	0	0	0	-	-	1	3	0	0	1	10	0	0
Geography	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Integrated Science	8	4	2	4	0	0	0	0	1	5	-	-	4	10	0	0	0	0	1	3
Biology	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Computer Studies	20	10	5	10	2	13	3	17	2	11	-	-	6	15	0	0	0	0	2	6
Commerce	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Accounting	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Communications	5	3	0	0	0	0	0	0	1	5	-	-	2	5	0	0	2	20	0	0
Personal and Social Education	6	3	1	2	0	0	1	6	1	5	-	-	0	0	0	0	1	10	2	6
Perceptual Motor Training	2	1	0	0	0	0	1	6	0	0	-	-	0	0	0	0	1	10	0	0
Self-Care	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Independent Living Skills	1	1	0	0	0	0	0	0	0	0	-	-	1	3	0	0	0	0	0	0
Physical Training	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Daily Living Training	1	1	0	0	0	0	1	6	0	0	-	-	0	0	0	0	0	0	0	0
Informal Prevocational Training	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Electronic Engineering	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Technical Drawing	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Vehicle Repair	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Visual Arts	9	5	3	6	0	0	0	0	1	5	-	-	2	5	1	11	0	0	2	6
Music	7	4	2	4	0	0	1	6	0	0	-	-	2	5	0	0	1	10	1	3
Home Economics	2	1	0	0	0	0	0	0	1	5	-	-	0	0	0	0	0	0	1	3
Art and Craft	1	1	0	0	0	0	0	0	0	0	-	-	0	0	0	0	1	10	0	0
Design and Technology	2	1	0	0	0	0	1	6	1	5	-	-	0	0	0	0	0	0	0	0
Art and Design	0	0	0	0	0	0	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Physical Education	1	1	0	0	1	7	0	0	0	0	-	-	0	0	0	0	0	0	0	0
Religious Studies	3	2	0	0	1	7	0	0	1	5	-	-	1	3	0	0	0	0	0	0
Others	5	3	1	2	1	7	2	11	0	0	-	-	0	0	1	11	0	0	0	0

C=Frequency count.

Around 65% of the teachers used computers in class 1 to 10 times during the week prior to the conduct of the questionnaire survey

Another aspect of computer usage by teachers/therapists is about the frequency and mode of usage in class/in the therapy or training sections. It is desirable for teachers to arrange more time for students to use computers in groups on meaningful tasks so as to construct knowledge. When asked about the use of IT in teaching, around 65% of the teachers in MS1 and MS2 used computers in class 1 to 10 times during the week prior to the conduct of the questionnaire survey while 22% and 28% of NC teachers as well as 35% and 32% of ID teachers in MS1 and MS2 respectively used computers in class 11 times or more. No statistically significant difference was found in the frequency of using computers in class by NC teachers in MS2 (Table 8.36a, [E5]TQ1).

When therapists were asked about the use of IT in the therapy or training sections, 27% (n=3) and 67% (n=6) of SPH, 17% (n=1) and 43% (n=3) of PHY as well as 86% (n=6) and 64% (n=7) of OC therapists in MS1 and MS2 respectively used computers in the therapy or training sections 1 to 10 times during the week prior to the conduct of the questionnaire survey. 27% and 33% of SPH (n=3) as well as 33% (n=2) and 14% (n=1) of PHY therapists used computers in the therapy or training sections 11 times or more. 45% of SPH (n=5) in MS1, 50% and 43% of PHY (n=3) as well as 14% (n=1) and 27% (n=27) of OC therapists in MS1 and MS2 respectively did not use computers in the therapy or training sections (Table 8.36b, [E8]THQ1).

Table 8.36a The frequency in which teachers used computers in class during the week prior to the conduct of the questionnaire survey ([E5]TQ1)

Frequency	Percentage (%) of Teachers choosing the option					
	NC		$\chi^2_{(df=4)}$	*P*-value	ID	
	MS1 (N=103)	MS2 (N=137)			MS1 (N=88)	MS2 (N=59)
31 times or more	3	1			5	5
21 to 30 times	3	6			5	7
11 to 20 times	16	21	4.46	0.347 [b]	25	20
1 to 10 times	65	64			65	66
Nil	14	8			1	2

Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.36b The frequency in which therapists used computers in therapy/training sections during the week prior to the conduct of the questionnaire survey ([E8]THQ1)

Frequency	Percentage (%)of Therapists choosing the option					
	SPH		PHY		OC	
	MS1 (N=11)	MS2 (N=9)	MS1 (N=6)	MS2 (N=7)	MS1 (N=7)	MS2 (N=11)
31 times or more	9	22	0	0	0	0
21 to 30 times	0	0	0	0	0	0
11 to 20 times	18	11	33	14	0	9
1 to 10 times	27	67	17	43	86	64
Nil	45	0	50	43	14	27

Teachers used computers the most frequently for explanation and demonstration to the whole class

As for the mode of computer usage, the most frequently reported mode that teachers used computers to conduct teaching in class was using computers themselves for explanation and demonstration to the whole class (34% and 62% of NC and ID teachers respectively in MS1 and around 50% of teachers in MS2 rated frequently or very frequently). 23% and 13% of NC and ID teachers respectively in MS1 as well as 20% and 12% in MS1 and MS2 respectively reported to have students working individually with computers frequently or very frequently. 13% or less of the teachers in MS1 and MS2 reported to have students working in groups with computers frequently or very frequently. Teachers from HI, PD, ID-M, and ID-S in MS1 as well as SSD, ID-Mod and ID-S in MS2 used computers themselves for explanation and demonstration to the whole class very frequently with mean ratings of 4.00 or above on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. Teachers from SSD, PD and ID-S in MS1 reported having students working in groups with computers occasionally (一般) with mean ratings of 3.00 or above. Teachers from H in MS1 and MS2 as well as HI and PD in MS1 reported having students working individually with computers occasionally (一般) with mean rating of 3.00 or above. The mean values of VI teachers in MS1 in the above three ways to conduct teaching in class were below 3.00. No statistically significant difference was observed in NC teachers' perceived frequency of the different ways they used computers to conduct teaching in class in MS2 (Table 8.37a, [E5]TQ3a-c).

As for therapists, 27% (n=3) and 14% (n=1) of SPH and OC therapists respectively in MS1 as well as 22% (n=2) and 45% (n=5) respectively in MS2 frequently or very frequently used computers themselves to provide therapy or training. 64% (n=7), 84% (n=5) and 28% (n=2) of SPH, PHY and OC therapists respectively in MS1 as well as 77% (n=7), 72% (n=5) and 27% (n=3) respectively in MS2 rarely or never had students working individually with computers. Only 9% of SPH (n=1) in MS1, 14% (n=1) and 18% (n=2) of PHY and OC therapists respectively in MS2 reported to have students working in groups with computers frequently or very frequently (Table 8.37b, [E8]THQ2a-c).

Teachers tended to use IT frequently to support students in learning subject knowledge

When looking into the frequency in which teachers used IT to conduct teaching, 44% and 60% of NC and ID teachers in MS1 as well as 51% and 59% respectively in MS2 reported to have used IT frequently or very frequently to support students in learning subject knowledge. On the other hand, 20% and 27% of NC and ID teachers respectively in MS1 as well as 21% and 29% respectively in MS2 reported that they used IT frequently or very frequently to design a learning context to foster students' higher-order thinking capability. 14% and 8% of NC and ID teachers respectively in MS1 and 9% and 7% respectively in MS2 used IT to arrange learning in small groups frequently or very frequently. No statistically significant difference was observed in NC teachers' frequency of using IT to conduct teaching in MS2 (Table 8.38a, [E5]TQ4a-c).

As for therapists, the most frequently reported use of IT was supporting students in therapy or training, with 73% (n=8), 33% (n=2) and 14% (n=1) of SPH, PHY and OC therapists respectively in MS1 as well as 55% (n=5), 43% (n=3) and 63% (n=7) respectively in MS2 reporting to have done this frequently or very frequently. On the other hand, 36% (n=4), 17% (n=1) of SPH and PHY therapists respectively in MS1 as well as 33% (n=3), 29% (n=2), 27% (n=3) respectively in MS2 used IT frequently or very frequently to design therapy or training contexts to foster students' higher-order thinking capability. 36% (n=4), 66% (n=4) and 71% (n=5) of SPH, PHY and OC therapists respectively in MS1 as well as 66% (n=6), 28% (n=2) and 9% (n=1) respectively in MS2 reported that they rarely or never used IT to arrange small-group therapy or training (Table 8.38b, [E8]THQ3a-c).

34%-44% of the teachers assigned digital resources for students to learn subject knowledge beyond school hours in MS1 and 31%-54% of them did so in MS2

It is also important to find out the frequency in which special school teachers assigned digital resources to students as well as teachers' perception of the usefulness of these resources to students' learning. 44% and 34% of NC and ID teachers respectively in MS1 as well as 54% and 31% respectively in MS2 reported having assigned digital resources to students for learning subject knowledge beyond school hours (Table 8.39a, [E5]TQ10b). Amongst them, 82% and 77% of NC and ID teachers respectively in MS1 as well as 65% and 78% respectively in MS2 assigned digital resources 1 to 4 times during the week prior to the conduct of the questionnaire survey (Table 8.39a, [E5]TQ10c). No statistically significant difference was found in the frequency of assigning digital resources by NC teachers in MS2.

As for therapists, the frequency in which therapists assigned digital resources to students as well as therapists' perception of the usefulness of these resources to students' therapy or training are surveyed. In MS1, 45% of SPH (n=5) and 14% of OC therapists (n=1) reported having assigned their students to make use of digital resources to proceed therapy or training beyond school hours. 11%, 14% and 18% of SPH, PHY and OC therapists respectively did so in MS2 (Table 8.39b, [E8]THQ9b). For those therapists who did so, 40% (n=2) and 100% (n=1) of SPH in MS1 and MS2 respectively as well as all of OC therapists (n=1) in MS1 assigned digital resources 1 to 4 times during the week prior to the conduct of the questionnaire survey while 40% of SPH (n=2) in MS1 and 50% of OC therapists (n=1) in MS2 assigned digital resources 5 to 10 times (Table 8.39b, [E8]TQ9c). These figures should be interpreted with caution due to the small sample size.

Teachers rarely used electronic means to collect students' assignments and assess or respond to students' learning situation

Designing learning activities is just one aspect of the pedagogies in teaching with IT. IT can be used as an effective tool to collect students' assignments, to manage students' learning process, to report assessment results and to give timely feedback to students.

The findings revealed that teachers rarely used electronic ways to assess or respond to students' learning situation (Table 8.40a, [E5]TQ6a-g). Less than 12% of the special school teachers in MS1 and MS2 used the listed methods frequently or very frequently. For NC teachers in MS1 and MS2, 45%-48% of them never gave feedback to students through e-mail and designed learning activities to cater for individual students' needs based on the students' information obtained from electronic means. 58% to 69% of them never used other assessment methods. For ID teachers in MS1 and MS2, 52% to 88% of them never used these electronic methods. The overall low frequency was also reflected in the mean values of these assessment methods or responses. All mean ratings for NC and ID teachers in MS1 and MS2 fell in the range of 1.15 to 1.94 (SD:0.45-1.28) on a scale from 1 to 5 where 1 was 'never' and 5 was 'very frequently'. No statistically significant difference was noted in MS2 for NC teachers.

Similar to the responses of teachers, therapists also expressed low frequency in using electronic means to assess or respond to students' therapy or training situation in MS1. 55% to 82% of SPH therapists (n=6-9) rarely or never used electronic ways to assess or respond to students' therapy or training whereas almost all PHY (n=5-6) and all OC therapists (n=7) rarely or never did so. In MS2, 57% and 27% of PHY and OC therapists respectively indicated that they frequently or very frequently used e-learning platforms to understand students' learning progress. Less than 20% of them frequently or very frequently used other electronic ways for these purposes (Table 8.40b, [E8]THQ5a-g).

Students had similar responses. Less than 16% of the students in MS1 (8%-15% of NC and 1%-7% of ID) and 4%-20% in MS2 (12%-16% of NC and 4%-20% of ID) indicated that their teachers assessed or responded to their learning situation frequently or very frequently through different electronic means. Although the mean ratings were somewhat higher than those reported by NC teachers, there was only a very small difference in the mean ratings amongst the different electronic methods. The mean ratings for both MS1 and MS2 fell in the range of 1.75 to 2.32 (SD:1.06-1.36) for NC and 1.24 to 1.92 (SD:0.72-1.40) for ID students on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 8.40a, [E6-1/E6-2/E6-3/E6-4/E6-5/E6-6]SQ6a-f). No statistically significant difference was noted in MS2 for NC students.

Students reported the frequency their therapists used different electronic means to assess or respond to their therapy or training (Table 8.40b, [E6-4/E6-5/E6-6]SQ7). In MS1, less than 10% of the special school students (6% of NC and 1%-8% of ID) indicated that their therapists used electronic means frequently or very frequently to assess or respond to their therapy or training situation. In MS2, less than 5% of NC as well as 5%-27% of ID students indicated that therapists frequently or very frequently used the electronic means for these purposes. No statistically significant difference was noted in MS2 for NC students.

Table 8.37a Teachers' perceived frequency of the different ways they used computers to conduct teaching in class ([E5]TQ3a-c)

	MS1 Overall																							
	NC (N=103)			ID (N=88)			H (N=51)		SSD (N=18)		VI (N=22)		HI (N=6)		ID-M (N=26)		ID-Mmod (N=34)		ID-Mod (N=15)		ID-S (N=13)		PD (N=6)	
	Mean	SD	%	Mean	SD	%	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
a.	3.25	1.05	34	3.97	0.88	62	3.32	0.82	3.00	1.00	2.90	1.17	4.17	0.75	4.31	0.70	3.71	0.84	3.67	0.98	4.00	0.95	4.17	0.98
b.	2.83	1.04	23	2.75	0.90	13	3.21	1.08	2.67	0.58	2.65	1.23	3.83	0.75	2.56	1.15	2.74	0.67	2.53	0.64	2.92	0.79	3.00	0.89
c.	2.47	1.01	13	2.36	0.94	9	2.42	0.84	3.33	2.08	2.00	0.92	2.83	0.75	2.00	1.03	2.50	0.90	2.20	0.86	3.00	0.85	3.33	1.03

	NC *P*-value	MS2 Overall																							
		NC (N=137)			ID (N=59)			H (N=51)		SSD (N=15)		VI (N=18)		HI (N=19)		ID-M (N=0)		ID-Mmod (N=40)		ID-Mod (N=9)		ID-S (N=10)		PD (N=34)	
		Mean	SD	%	Mean	SD	%	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
a.	0.068	3.49	1.07	50	3.80	0.83	54	3.18	0.99	4.07	1.16	3.17	1.20	3.42	1.07	-	-	3.70	0.79	4.00	0.87	4.00	0.94	3.91	0.87
b.	0.791	2.83	0.96	20	2.66	0.84	12	3.02	0.88	2.40	0.74	2.89	1.02	2.63	1.12	-	-	2.70	0.72	2.78	0.97	2.40	1.17	2.82	1.00
c.	0.163	2.26	0.94	7	2.39	0.97	8	2.35	0.87	1.67	0.72	2.39	1.09	2.11	1.15	-	-	2.48	0.93	2.11	0.78	2.30	1.25	2.38	0.85

Ways to conduct teaching in class

a. Using computer by yourself for explanation and demonstration to the whole class

b. Students working individually with computers

c. Students working in groups with computers

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.37b Therapists' perceived frequency of the different ways they used computers to conduct therapy/training in the therapy/training sections ([E8]THQ2a-c)

Therapist types		MS1										MS2									
		Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never									
SPH	a.	2.64	1.36	11	1	(9)	2	(18)	3	(27)	2	(18)	3	(27)	2.44	1.51	9	1	(11)	1	(11)	3	(33)	0	(0)	4	(44)
	b.	1.82	0.98	11	0	(0)	0	(0)	4	(36)	1	(9)	6	(55)	2.11	1.45	9	1	(11)	1	(11)	0	(0)	3	(33)	4	(44)
	c.	2.18	1.17	11	0	(0)	1	(9)	5	(45)	0	(0)	5	(45)	1.78	0.97	9	0	(0)	0	(0)	3	(33)	1	(11)	5	(56)
PHY	a.	1.67	0.82	6	0	(0)	0	(0)	1	(17)	2	(33)	3	(50)	2.29	0.95	7	0	(0)	0	(0)	4	(57)	1	(14)	2	(29)
	b.	1.50	0.84	6	0	(0)	0	(0)	1	(17)	1	(17)	4	(67)	2.14	1.46	7	1	(14)	0	(0)	1	(14)	2	(29)	3	(43)
	c.	1.50	0.84	6	0	(0)	0	(0)	1	(17)	1	(17)	4	(67)	1.86	1.57	7	1	(14)	0	(0)	1	(14)	0	(0)	5	(71)
OC	a.	2.71	0.95	7	0	(0)	1	(14)	4	(57)	1	(14)	1	(14)	3.36	0.92	11	1	(9)	4	(36)	4	(36)	2	(18)	0	(0)
	b.	2.57	0.79	7	0	(0)	0	(0)	5	(71)	1	(14)	1	(14)	2.91	1.14	11	0	(0)	4	(36)	4	(36)	1	(9)	2	(18)
	c.	1.71	0.95	7	0	(0)	0	(0)	2	(29)	1	(14)	4	(57)	2.18	1.17	11	0	(0)	2	(18)	2	(18)	3	(27)	4	(36)

Ways to conduct therapy/training

a. Using computer by myself to provide therapy/training

b. Students working individually with computers to proceed therapy/training

c. Students working in groups with computers to proceed therapy/training

Mean: 1="Never" and 5="Very frequently"

Table 8.38a The frequency that teachers used IT to conduct teaching ([E5]TQ4a-c)

Special school types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	*P*-value
NC	a.	3.43	0.94	103	14 (14)	31 (30)	46 (45)	9 (9)	3 (3)	3.54	0.92	137	21 (15)	49 (36)	53 (39)	11 (8)	3 (2)	0.315
	b.	2.75	0.96	103	4 (4)	16 (16)	42 (41)	32 (31)	9 (9)	2.92	0.90	137	8 (6)	20 (15)	68 (50)	35 (26)	6 (4)	0.166
	c.	2.45	0.97	103	4 (4)	10 (10)	27 (26)	49 (48)	13 (13)	2.39	0.91	137	4 (3)	8 (6)	45 (33)	60 (44)	20 (15)	0.807
ID	a.	3.76	0.84	88	18 (20)	35 (40)	32 (36)	2 (2)	1 (1)	3.68	0.88	59	10 (17)	25 (42)	20 (34)	3 (5)	1 (2)	---
	b.	3.08	0.85	88	4 (5)	19 (22)	49 (56)	12 (14)	4 (5)	3.05	0.92	59	3 (5)	14 (24)	28 (47)	11 (19)	3 (5)	---
	c.	2.25	0.95	88	1 (1)	6 (7)	29 (33)	30 (34)	22 (25)	2.17	0.91	59	0 (0)	4 (7)	18 (31)	21 (36)	16 (27)	---

Activities which teachers used IT to conduct

a. To support students in learning the subject knowledge

b. To design learning context so as to foster students' higher-order thinking capability

c. To arrange small group learning

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.38b The frequency that therapists used IT to conduct therapy/training ([E8]THQ3a-c)

Therapist types		MS1 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	MS2 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never
SPH	a.	4.27	0.90	11	6 (55)	2 (18)	3 (27)	0 (0)	0 (0)	3.78	1.09	9	3 (33)	2 (22)	3 (33)	1 (11)	0 (0)
	b.	3.09	1.38	11	2 (18)	2 (18)	4 (36)	1 (9)	2 (18)	2.33	1.58	9	1 (11)	2 (22)	0 (0)	2 (22)	4 (44)
	c.	2.82	1.25	11	1 (9)	2 (18)	4 (36)	2 (18)	2 (18)	2.22	1.30	9	1 (11)	0 (0)	2 (22)	3 (33)	3 (33)
PHY	a.	3.00	1.79	6	2 (33)	0 (0)	2 (33)	0 (0)	2 (33)	3.14	1.57	7	2 (29)	1 (14)	1 (14)	2 (29)	1 (14)
	b.	2.00	1.26	6	0 (0)	1 (17)	1 (17)	1 (17)	3 (50)	2.57	1.13	7	0 (0)	2 (29)	1 (14)	3 (43)	1 (14)
	c.	2.33	1.51	6	1 (17)	0 (0)	1 (17)	2 (33)	2 (33)	2.86	1.07	7	0 (0)	2 (29)	3 (43)	1 (14)	1 (14)
OC	a.	2.71	0.95	7	0 (0)	1 (14)	4 (57)	1 (14)	1 (14)	3.73	1.19	11	3 (27)	4 (36)	3 (27)	0 (0)	1 (9)
	b.	2.29	0.49	7	0 (0)	0 (0)	2 (29)	5 (71)	0 (0)	2.73	1.10	11	0 (0)	3 (27)	4 (36)	2 (18)	2 (18)
	c.	2.29	0.49	7	0 (0)	0 (0)	2 (29)	5 (71)	0 (0)	3.55	1.13	11	2 (18)	4 (36)	4 (36)	0 (0)	1 (9)

Activities which therapists used IT to conduct therapy/training

a. To support students for therapy/training

b. To design therapy/training contexts to foster students' higher-order thinking capability

c. To arrange small-group therapy/training

Mean: 1="Never" and 5="Very frequently"

Table 8.39a Frequency of teachers assigning digital resources for students to learn subject knowledge beyond school hours during the week prior to the conduct of the questionnaire survey ([E5]TQ10b,c)

	Percentage (%) of Teachers choosing the option					
	NC		*P*-value		ID	
	MS1 (N=103)	MS2 (N=137)			MS1 (N=88)	MS2 (N=59)
Yes	44	54	0.114		34	31
No	56	46			66	69
Frequency	**(N=45)**	**(N=74)**	$\chi^2_{(df=4)}$	***P*-value**	**(N=30)**	**(N=18)**
16 times or above	0	1			0	0
11 to 15 times	0	1			0	0
5 to 10 times	4	16	5.85	0.211[b]	13	11
1 to 4 times	82	65			77	78
Nil	13	16			10	11

[a] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.39b Frequency of therapists assigning digital resources for students to proceed therapy/training beyond school hours during the week prior to the conduct of the questionnaire survey ([E8]THQ9b,c)

	Percentage (%) of Therapists choosing the option					
	SPH		PHY		OC	
	MS1 (N=11)	MS2 (N=9)	MS1 (N=6)	MS2 (N=7)	MS1 (N=7)	MS2 (N=11)
Yes	45	11	0	14	14	18
No	55	89	100	86	86	82
Frequency	**(N=5)**	**(N=1)**	**(N=0)**	**(N=1)**	**(N=1)**	**(N=2)**
16 times or above	0	0	0	0	0	0
11 to 15 times	0	0	0	0	0	0
5 to 10 times	40	0	0	0	0	50
1 to 4 times	40	100	0	0	100	0
Nil	20	0	0	1	0	50

Table 8.40a The frequency of electronic means that teachers used for assessing or responding to students' learning situation ([E5]TQ6a-g, [E6-4/E6-5/E6-6]SQ6a-f)

		MS1																MS2																*P*-value
		Mean (1-5)	SD	N	Count (%) choosing the option													Mean (1-5)	SD	N	Count (%) choosing the option														
					Very Frequently			Frequently			Occasionally (間中)			Rarely			Never																		
NC Teachers	a.	1.52	0.78	103	0	(	0)	3	(	3)	9	(	9)	27	(	26)	64	(	62)	1.53	0.76	137	1	(	1)	2	(	1)	10	(	7)	42	(	31)	82	(	60)	0.855
	b.	1.51	0.80	103	0	(	0)	4	(	4)	8	(	8)	25	(	24)	66	(	64)	1.62	0.90	137	3	(	2)	2	(	1)	15	(	11)	37	(	27)	80	(	58)	0.359
	c.	1.50	0.79	103	0	(	0)	4	(	4)	7	(	7)	26	(	25)	66	(	64)	1.56	0.85	137	2	(	1)	2	(	1)	14	(	10)	35	(	26)	84	(	61)	0.621
	d.	1.57	0.94	103	2	(	2)	4	(	4)	8	(	8)	23	(	22)	66	(	64)	1.50	0.70	137	0	(	0)	1	(	1)	13	(	9)	39	(	28)	84	(	61)	0.918
	e.	1.88	1.09	103	4	(	4)	6	(	6)	13	(	13)	31	(	30)	49	(	48)	1.94	1.09	137	5	(	4)	8	(	6)	23	(	17)	39	(	28)	62	(	45)	0.627
	f.	1.50	0.90	103	2	(	2)	3	(	3)	7	(	7)	20	(	19)	71	(	69)	1.39	0.63	137	0	(	0)	1	(	1)	8	(	6)	34	(	25)	94	(	69)	0.802
	g.	1.75	0.87	103	0	(	0)	6	(	6)	11	(	11)	37	(	36)	49	(	48)	1.78	0.90	137	2	(	1)	1	(	1)	28	(	20)	40	(	29)	66	(	48)	0.792
ID Teachers	a.	1.67	1.01	88	1	(	1)	7	(	8)	8	(	9)	18	(	20)	54	(	61)	1.78	1.20	59	4	(	7)	2	(	3)	7	(	12)	10	(	17)	36	(	61)	---
	b.	1.81	0.99	88	1	(	1)	4	(	5)	18	(	20)	19	(	22)	46	(	52)	1.81	1.15	59	3	(	5)	2	(	3)	10	(	17)	10	(	17)	34	(	58)	---
	c.	1.64	0.90	88	1	(	1)	1	(	1)	16	(	18)	17	(	19)	53	(	60)	1.85	1.28	59	5	(	8)	2	(	3)	8	(	14)	8	(	14)	36	(	61)	---
	d.	1.27	0.58	88	0	(	0)	0	(	0)	6	(	7)	12	(	14)	70	(	80)	1.19	0.51	59	0	(	0)	0	(	0)	3	(	5)	5	(	8)	51	(	86)	---
	e.	1.38	0.70	88	0	(	0)	2	(	2)	5	(	6)	17	(	19)	64	(	73)	1.41	0.95	59	1	(	2)	4	(	7)	1	(	2)	6	(	10)	47	(	80)	---
	f.	1.20	0.53	88	0	(	0)	0	(	0)	5	(	6)	8	(	9)	75	(	85)	1.15	0.45	59	0	(	0)	0	(	0)	2	(	3)	5	(	8)	52	(	88)	---
	g.	1.59	0.93	88	1	(	1)	3	(	3)	12	(	14)	15	(	17)	57	(	65)	1.58	1.00	59	1	(	2)	4	(	7)	4	(	7)	10	(	17)	40	(	68)	---
NC Students	a.	1.77	1.06	75	2	(	3)	5	(	7)	8	(	11)	19	(	25)	41	(	55)	2.01	1.27	153	12	(	8)	10	(	7)	21	(	14)	34	(	22)	76	(	50)	0.830
	b.	1.91	1.07	74	1	(	1)	7	(	9)	12	(	16)	18	(	24)	36	(	49)	1.97	1.21	153	8	(	5)	14	(	9)	20	(	13)	35	(	23)	76	(	50)	0.573
	c.	1.99	1.11	75	0	(	0)	9	(	12)	18	(	24)	11	(	15)	37	(	49)	1.93	1.22	153	10	(	7)	8	(	5)	24	(	16)	30	(	20)	81	(	53)	0.137
	d.	1.93	1.08	75	2	(	3)	4	(	5)	17	(	23)	16	(	21)	36	(	48)	1.89	1.23	153	10	(	7)	10	(	7)	17	(	11)	32	(	21)	84	(	55)	0.084
	e.	2.12	1.24	73	4	(	5)	7	(	10)	15	(	21)	15	(	21)	32	(	44)	2.32	1.28	153	14	(	9)	11	(	7)	40	(	26)	33	(	22)	55	(	36)	0.785
	f.	1.75	1.22	71	3	(	4)	6	(	8)	9	(	13)	5	(	7)	48	(	68)	1.95	1.36	153	15	(	10)	9	(	6)	20	(	13)	19	(	12)	90	(	59)	0.822
ID Students	a.	1.56	0.98	119	3	(	3)	0	(	0)	23	(	20)	8	(	7)	85	(	71)	1.88	1.40	60	5	(	8)	7	(	12)	4	(	7)	4	(	7)	40	(	67)	---
	b.	1.83	1.22	118	9	(	7)	0	(	0)	26	(	22)	11	(	10)	72	(	61)	1.92	1.29	60	2	(	3)	9	(	15)	8	(	13)	4	(	7)	37	(	62)	---
	c.	1.59	1.01	119	4	(	3)	1	(	1)	21	(	18)	10	(	9)	83	(	70)	1.90	1.35	60	4	(	7)	7	(	12)	6	(	10)	5	(	8)	38	(	63)	---
	d.	1.42	0.84	114	1	(	1)	2	(	2)	13	(	12)	11	(	10)	87	(	76)	1.58	1.12	60	3	(	5)	2	(	3)	6	(	10)	5	(	8)	44	(	73)	---
	e.	1.38	0.72	115	0	(	0)	1	(	1)	13	(	11)	16	(	14)	86	(	74)	1.80	1.35	60	5	(	8)	5	(	8)	4	(	7)	5	(	8)	41	(	68)	---
	f.	1.24	0.72	115	2	(	2)	0	(	0)	7	(	6)	6	(	5)	100	(	87)	1.45	0.89	60	1	(	2)	1	(	2)	7	(	12)	6	(	10)	45	(	75)	---

Methods to assess or respond to students' learning situation

a. To understand students' learning progress through the online test system of the school

b. To understand students' learning progress through the e-learning platform[#] records of the school

c. To understand students' learning progress through the opinion section of the e-learning platform

d. To give feedback to students through the forum/chatroom

e. To give feedback to students through Email

f. To give feedback to students through instant messaging system (e.g. ICQ)

g. To design learning activities based on the communication methods stated in (a) to (f) so as to cater for individual students' needs.

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

Table 8.40b The frequency of electronic means that therapists used for assessing or responding to students' therapy/training situation ([E6-4/E6-5/E6-6]SQ7a-f, [E8]THQ5a-g)

Special school types/ Stakeholder		MS1 Mean (1-5)	SD	N	Count (%) choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	MS2 Mean (1-5)	SD	N	Count (%) choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never	*P*-value
SPH	a.	1.82	1.08	11	0 (0)	1 (9)	2 (18)	2 (18)	6 (55)	1.33	0.71	9	0 (0)	0 (0)	1 (11)	1 (11)	7 (78)	---
	b.	1.55	0.82	11	0 (0)	0 (0)	2 (18)	2 (18)	7 (64)	1.44	1.01	9	0 (0)	1 (11)	0 (0)	1 (11)	7 (78)	---
	c.	1.55	0.82	11	0 (0)	0 (0)	2 (18)	2 (18)	7 (64)	1.33	1.00	9	0 (0)	1 (11)	0 (0)	0 (0)	8 (89)	---
	d.	1.45	0.82	11	0 (0)	0 (0)	2 (18)	1 (9)	8 (73)	1.00	0.00	9	0 (0)	0 (0)	0 (0)	0 (0)	9 (100)	---
	e.	1.73	1.10	11	0 (0)	1 (9)	2 (18)	1 (9)	7 (64)	1.11	0.33	9	0 (0)	0 (0)	0 (0)	1 (11)	8 (89)	---
	f.	1.64	1.12	11	0 (0)	1 (9)	2 (18)	0 (0)	8 (73)	1.00	0.00	9	0 (0)	0 (0)	0 (0)	0 (0)	9 (100)	---
	g.	2.00	1.18	11	0 (0)	1 (9)	4 (36)	0 (0)	6 (55)	1.22	0.67	9	0 (0)	0 (0)	1 (11)	0 (0)	8 (89)	---
PHY	a.	1.33	0.82	6	0 (0)	0 (0)	1 (17)	0 (0)	5 (83)	1.86	1.57	7	1 (14)	0 (0)	1 (14)	0 (0)	5 (71)	---
	b.	1.00	0.00	6	0 (0)	0 (0)	0 (0)	0 (0)	6 (100)	3.14	2.04	7	3 (43)	1 (14)	0 (0)	0 (0)	3 (43)	---
	c.	1.00	0.00	6	0 (0)	0 (0)	0 (0)	0 (0)	6 (100)	1.00	0.00	7	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	---
	d.	1.00	0.00	6	0 (0)	0 (0)	0 (0)	0 (0)	6 (100)	1.29	0.76	7	0 (0)	0 (0)	1 (14)	0 (0)	6 (86)	---
	e.	1.00	0.00	6	0 (0)	0 (0)	0 (0)	0 (0)	6 (100)	1.71	0.95	7	0 (0)	0 (0)	2 (29)	1 (14)	4 (57)	---
	f.	1.00	0.00	6	0 (0)	0 (0)	0 (0)	0 (0)	6 (100)	1.29	0.76	7	0 (0)	0 (0)	1 (14)	0 (0)	6 (86)	---
	g.	1.00	0.00	6	0 (0)	0 (0)	0 (0)	0 (0)	6 (100)	1.71	1.25	7	0 (0)	1 (14)	1 (14)	0 (0)	5 (71)	---
OC	a.	1.00	0.00	7	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	1.91	1.38	11	1 (9)	1 (9)	0 (0)	3 (27)	6 (55)	---
	b.	1.14	0.38	7	0 (0)	0 (0)	0 (0)	1 (14)	6 (86)	2.18	1.33	11	0 (0)	3 (27)	1 (9)	2 (18)	5 (45)	---
	c.	1.00	0.00	7	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	1.64	1.03	11	0 (0)	1 (9)	1 (9)	2 (18)	7 (64)	---
	d.	1.00	0.00	7	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	1.27	0.47	11	0 (0)	0 (0)	0 (0)	3 (27)	8 (73)	---
	e.	1.14	0.38	7	0 (0)	0 (0)	0 (0)	1 (14)	6 (86)	1.36	0.50	11	0 (0)	0 (0)	0 (0)	4 (36)	7 (64)	---
	f.	1.00	0.00	7	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	1.27	0.47	11	0 (0)	0 (0)	0 (0)	3 (27)	8 (73)	---
	g.	1.00	0.00	7	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	1.82	1.17	11	0 (0)	2 (18)	0 (0)	3 (27)	6 (55)	---
NC Students	a.	1.41	1.06	17	1 (6)	0 (0)	1 (6)	1 (6)	14 (82)	1.42	0.82	53	1 (2)	0 (0)	5 (9)	8 (15)	39 (74)	0.553
	b.	1.35	0.86	17	0 (0)	1 (6)	1 (6)	1 (6)	14 (82)	1.42	0.75	53	0 (0)	1 (2)	5 (9)	9 (17)	38 (72)	0.474
	c.	1.35	0.86	17	0 (0)	1 (6)	1 (6)	1 (6)	14 (82)	1.45	0.77	53	0 (0)	1 (2)	6 (11)	9 (17)	37 (70)	0.395
	d.	1.35	0.79	17	0 (0)	1 (6)	0 (0)	3 (18)	13 (76)	1.40	0.66	53	0 (0)	0 (0)	5 (9)	11 (21)	37 (70)	0.610
	e.	1.53	1.12	17	1 (6)	0 (0)	2 (12)	1 (6)	13 (76)	1.49	0.70	53	0 (0)	0 (0)	6 (11)	14 (26)	33 (62)	0.483
	f.	1.41	0.87	17	0 (0)	1 (6)	1 (6)	2 (12)	13 (76)	1.42	0.89	53	1 (2)	1 (2)	5 (9)	5 (9)	41 (77)	0.955
ID Students	a.	1.46	0.98	116	5 (4)	0 (0)	11 (9)	12 (11)	88 (76)	1.93	1.52	60	8 (13)	5 (8)	3 (5)	3 (5)	41 (68)	---
	b.	1.60	1.16	119	8 (7)	1 (1)	12 (10)	12 (10)	87 (73)	1.95	1.45	60	4 (7)	12 (20)	1 (2)	3 (5)	40 (67)	---
	c.	1.45	0.96	116	5 (4)	0 (0)	10 (9)	13 (11)	88 (76)	1.88	1.44	60	7 (12)	4 (7)	4 (7)	5 (8)	40 (67)	---
	d.	1.30	0.75	116	2 (2)	0 (0)	9 (7)	10 (9)	95 (82)	1.73	1.22	60	2 (3)	7 (12)	5 (8)	5 (8)	41 (68)	---
	e.	1.28	0.82	113	3 (3)	1 (1)	5 (4)	7 (6)	97 (86)	1.95	1.48	60	7 (12)	6 (10)	3 (5)	5 (8)	39 (65)	---
	f.	1.14	0.50	115	0 (0)	1 (1)	5 (4)	3 (3)	106 (92)	1.42	0.89	60	1 (2)	2 (3)	4 (7)	7 (12)	46 (77)	---

Methods to assess or respond to students'therapy/training situation

a. To understand students' therapy/training progress through the online test system of the school

b. To understand students' therapy/training progress through the e-learning platform records of the school

c. To understand students' therapy/training progress through the opinion section of the e-learning platform

d. To give feedback to students through the forum/chatroom

e. To give feedback to students through Email

f. To give feedback to students through instant messaging system (e.g. ICQ)

g. To design therapy/training activities based on the communication methods stated in (a) to (f) so as to cater for individual students' needs.

Mean: 1="Never" and 5="Very frequently"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.2.5 Confidence in Using IT for Learning and Teaching

Teachers tended to consider themselves as capable of integrating IT into teaching

As indicates in Table 8.41 ([E5]TQ27), teachers perceived themselves as capable of integrating IT into their daily teaching. 47% and 49% of NC and of ID teachers respectively in MS1 as well as 45% and 51% respectively in MS2 considered themselves to be capable or very capable of integrating IT into their daily teaching. The mean rating for NC and ID teachers were 3.35-3.44 (SD:0.65-0.76) and 3.45-3.46 (SD:0.64-0.66) respectively on a scale of 1 to 5 where 1 was 'totally not capable' and 5 was 'very capable'. No statistically significant difference was observed in MS2 for NC teachers.

Teachers perceived a higher level of confidence in selecting appropriate digital resources to conduct teaching and support students in learning the subject knowledge but they perceived a lower level of confidence in arranging small-group learning

When teachers were asked to rate their levels of confidence in using IT to conduct different teaching-related activities, 71% and 63% of NC and ID teachers respectively in MS1 as well as 50% and 67% respectively in MS2 rated themselves as confident or very confident in selecting appropriate digital resources for teaching. 57% and 56% of NC and ID teachers respectively in MS1 as well as 58% of both NC and ID teachers in MS2 rated themselves as confident or very confident in using IT to support students in learning the subject knowledge. Levels of confidence in using IT to conduct the following teaching activities were relatively lower in both MS1 and MS2: nurturing students' capability in information processing (NC=MS1: 42%, MS2: 44%; ID=MS1: 47%, MS2: 11%), designing learning context to foster students' higher-order thinking capability (NC=MS1: 32%, MS2: 39%; ID=MS1=MS2: 43%), arranging small-group learning (NC=MS1: 35%, MS2: 32%; ID=MS1: 24%, MS2: 21%) and building a 'student-centred' learning environment with the use of digital resources (NC=MS1: 33%, MS2: 29%; ID=MS1: 34%, MS2: 31%). All of the above mean values fell in the range of 3.13 to 3.69 (SD:0.60-0.81) for NC and 2.90-3.72 (SD:0.49-0.88) for ID teachers on a scale of 1 to 5 where 1 was 'totally not confident' and 5 was 'very confident'. A statistically significant decrease was noted in the confidence level of NC teachers in selecting appropriate digital resources for teaching (from 71% to 50%) in MS2 (Table 8.42a, [E5]TQ10f,10g,17a-c,19a).

When therapists were asked to rate their levels of confidence in using IT to conduct therapy-related or training-related activities, as reported in MS1, 40% of SPH therapists in MS1 (n=2) rated themselves as confident in selecting appropriate digital resources to conduct therapy or training and nurturing students' capability in information processing. 27% of SPH (n=3) and 33 % of PHY therapists (n=2) were confident in using IT to support students in therapy or training while 57% of OC therapists (n=4) were confident or very confident in doing so. 27% of SPH (n=3) and 17% of PHY therapists (n=1) were confident or very confident in designing therapy or training context to foster students' higher-order thinking capability while 14% of OC therapists (n=1) were very confident in doing so. 27% of SPH (n=3) and 17% of PHY therapists (n=1) were confident in using IT to arrange small-group therapy or training while 71% of OC therapists (n=5) were confident or very confident in doing so. In MS2, all therapists were confident in selecting appropriate digital resources to conduct therapy/training and to nurture students' capability in processing information (Table 8.42b, [E8]THQ9f,g,16a-c). Again, these figures must be interpreted with caution due to the small sample size.

Teachers perceived a higher level of agreement that their teaching could promote students' capability in information search, but they perceived a lower level of agreement that their teaching could promote students' capability in information collation and analysis as well as self-evaluation on learning outcomes

Pedagogical use of IT can be examined through the teachers' perceived effectiveness of promoting students' capability in performing different learning activities. When describing their approaches of using IT in their teaching, 53% and 42% of NC and ID teachers respectively in MS1 as well as 53% and 33% respectively in MS2 agreed or strongly agreed that their teaching could promote students' capability in "information searching". 26% to 37% of NC teachers agreed or strongly agreed that their teaching could promote students' skills in "reporting and presentation" (MS1: 33%, MS2: 37%), "information selection" (MS1=MS2: 31%) and "information collation and analysis" (MS1: 26%, MS2: 28%). The lowest rating was given to the higher level learning activities such as "self-evaluation on learning outcome" (MS1=MS2: 21%), with mean ratings below 3.00 on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. On the other hand, 7% to 16% of ID teachers in MS1 and MS2 rated their teaching could promote students' capability in performing the aforementioned learning activities, with mean ratings between 2.10 and 2.70 (SD:0.89-1.02) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. (Table 8.43a, [E5]TQ14a.i-v). No statistically significant difference was noted for NC teachers.

When therapists described their approaches of using IT in therapy or training activities, therapists disagreed that their therapy or training activities could promote students' ability in all aforementioned skills, with mean ratings ranged from 1.67 to 2.14 (SD:0.75-1.07) on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' in MS1. Except 54% of OC therapists agreed or strongly agreed that their therapy or training activities could promote students' capability in "information search" in MS2, therapists perceived a low level of agreement that their therapy or training activities could promote students' ability in all aforementioned skills, with mean ratings ranged from 2.00 to 3.00 (SD:0.83-1.40) (Table 8.43b, [E8]THQ13a.i-v).

Table 8.41 Teachers' capabilities of integrating IT into their daily teaching ([E5]TQ27)

Special school types	MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable	*P*-value
Capabilities of integrating IT into their daily teaching																	
NC	3.44	0.65	103	3 (3)	45 (44)	49 (48)	6 (6)	0 (0)	3.35	0.76	134	3 (2)	58 (43)	59 (44)	11 (8)	3 (2)	0.571
ID	3.45	0.64	86	2 (2)	40 (47)	39 (45)	5 (6)	0 (0)	3.46	0.66	57	1 (2)	28 (49)	24 (42)	4 (7)	0 (0)	---

Mean: 1="Totally not capable" and 5="Very capable"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

Table 8.42a Teachers' perceived levels of confidence in using IT to conduct different aspects of teaching activities ([E5]TQ10f,g,17a-c,19a)

Special school types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident	*P*-value
NC	10f.	3.69	0.60	45	1 (2)	31 (69)	11 (24)	2 (4)	0 (0)	3.45	0.67	74	1 (1)	36 (49)	33 (45)	3 (4)	1 (1)	0.032*
	10g.	3.38	0.65	45	1 (2)	18 (40)	23 (51)	3 (7)	0 (0)	3.35	0.71	74	1 (1)	32 (43)	34 (46)	6 (8)	1 (1)	0.993
	17a.	3.57	0.74	103	8 (8)	50 (49)	38 (37)	7 (7)	0 (0)	3.61	0.72	135	11 (8)	67 (50)	51 (38)	5 (4)	1 (1)	0.723
	17b.	3.19	0.67	102	0 (0)	33 (32)	56 (55)	12 (12)	1 (1)	3.27	0.76	135	4 (3)	49 (36)	63 (47)	18 (13)	1 (1)	0.375
	17c.	3.18	0.78	103	2 (2)	34 (33)	50 (49)	15 (15)	2 (2)	3.13	0.81	135	3 (2)	41 (30)	66 (49)	21 (16)	4 (3)	0.640
	19a.	3.17	0.77	103	3 (3)	31 (30)	51 (50)	17 (17)	1 (1)	3.13	0.66	136	0 (0)	39 (29)	77 (57)	19 (14)	1 (1)	0.710
ID	10f.	3.67	0.55	30	1 (3)	18 (60)	11 (37)	0 (0)	0 (0)	3.72	0.57	18	1 (6)	11 (61)	6 (33)	0 (0)	0 (0)	---
	10g.	3.43	0.57	30	0 (0)	14 (47)	15 (50)	1 (3)	0 (0)	3.00	0.49	18	0 (0)	2 (11)	14 (78)	2 (11)	0 (0)	---
	17a.	3.57	0.62	87	4 (5)	44 (51)	37 (43)	2 (2)	0 (0)	3.58	0.67	59	3 (5)	31 (53)	22 (37)	3 (5)	0 (0)	---
	17b.	3.40	0.64	87	2 (2)	36 (41)	44 (51)	5 (6)	0 (0)	3.32	0.73	59	1 (2)	24 (41)	28 (47)	5 (8)	1 (2)	---
	17c.	3.03	0.75	87	1 (1)	20 (23)	50 (57)	13 (15)	3 (3)	2.90	0.88	59	1 (2)	11 (19)	34 (58)	7 (12)	6 (10)	---
	19a.	3.30	0.61	87	1 (1)	29 (33)	53 (61)	3 (3)	1 (1)	3.24	0.57	58	0 (0)	18 (31)	36 (62)	4 (7)	0 (0)	---

Ways to use IT to conduct different aspects of teaching activities

10f. To select appropriate digital resources to conduct teaching
10g. To nurture students' capability in processing information
17a. To support students in learning the subject knowledge
17b. To design learning context so as to foster students' higher-order thinking capability
17c. To arrange small-group learning
19a. To build a student-centred learning environment with the use of digital resources

Mean: 1="Totally not confident" and 5="Very confident"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

Table 8.42b Therapists' perceived levels of confidence in using IT to conduct different aspects of therapy/training activities ([E8]THQ9f,g,16a-c)

Therapist type		MS1 Mean (1-5)	SD	N	Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident	MS2 Mean (1-5)	SD	N	Very confident	Confident	Quite confident (一般)	Not confident	Totally not confident
SPH	9f.	3.40	0.55	5	0 (0)	2 (40)	3 (60)	0 (0)	0 (0)	4.00	0.00	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)
	9g.	3.40	0.55	5	0 (0)	2 (40)	3 (60)	0 (0)	0 (0)	4.00	0.00	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)
	16a.	2.82	1.08	11	0 (0)	3 (27)	5 (45)	1 (9)	2 (18)	3.22	0.44	9	0 (0)	2 (22)	7 (78)	0 (0)	0 (0)
	16b.	2.82	1.08	11	0 (0)	3 (27)	5 (45)	1 (9)	2 (18)	3.11	0.60	9	0 (0)	2 (22)	6 (67)	1 (11)	0 (0)
	16c.	3.00	0.89	11	0 (0)	3 (27)	6 (55)	1 (9)	1 (9)	3.11	0.60	9	0 (0)	2 (22)	6 (67)	1 (11)	0 (0)
PHY	9f.	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4.00	0.00	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)
	9g.	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4.00	0.00	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)
	16a.	3.33	0.52	6	0 (0)	2 (33)	4 (67)	0 (0)	0 (0)	3.71	0.49	7	0 (0)	5 (71)	2 (29)	0 (0)	0 (0)
	16b.	3.00	0.63	6	0 (0)	1 (17)	4 (67)	1 (17)	0 (0)	3.00	0.82	7	0 (0)	2 (29)	3 (43)	2 (29)	0 (0)
	16c.	3.00	0.63	6	0 (0)	1 (17)	4 (67)	1 (17)	0 (0)	3.29	0.49	7	0 (0)	2 (29)	5 (71)	0 (0)	0 (0)
OC	9f.	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	4.00	0.00	2	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)
	9g.	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	4.00	0.00	2	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)
	16a.	3.71	0.76	7	1 (14)	3 (43)	3 (43)	0 (0)	0 (0)	3.64	0.81	11	1 (9)	6 (55)	3 (27)	1 (9)	0 (0)
	16b.	3.14	0.90	7	1 (14)	0 (0)	5 (71)	1 (14)	0 (0)	3.36	0.81	11	0 (0)	6 (55)	3 (27)	2 (18)	0 (0)
	16c.	3.71	0.95	7	1 (14)	4 (57)	1 (14)	1 (14)	0 (0)	3.36	1.03	11	1 (9)	5 (45)	2 (18)	3 (27)	0 (0)

Ways to use IT to conduct aspects of therapy/training activities

9f. To select appropriate digital resources to conduct therapy/training
9g. To nurture students' capability in processing information
16a. To support students in therapy/training
16b. To design learning context so as to foster students' higher-order thinking capability
16c. To arrange small-group therapy/training
Mean: 1="Totally not confident" and 5="Very confident"

Table 8.43a Teachers' perceived levels of agreement of promoting students' capability in performing different learning activities ([E5]TQ14a.i-v)

Special school types		MS1 Mean (1-5)	SD	N	Strongly agree	Agree	Neutral (一般)	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Strongly agree	Agree	Neutral (一般)	Disagree	Strongly disagree	*P*-value
NC	i.	3.46	0.83	103	6 (6)	48 (47)	39 (38)	7 (7)	3 (3)	3.46	0.84	135	8 (6)	64 (47)	49 (36)	10 (7)	4 (3)	0.941
	ii.	3.19	0.78	103	4 (4)	28 (27)	58 (56)	10 (10)	3 (3)	3.14	0.77	136	3 (2)	39 (29)	71 (52)	20 (15)	3 (2)	0.617
	iii.	2.95	0.86	103	1 (1)	26 (25)	49 (48)	21 (20)	6 (6)	2.96	0.86	135	2 (1)	37 (27)	53 (39)	39 (29)	4 (3)	0.888
	iv.	3.10	0.81	103	1 (1)	33 (32)	47 (46)	19 (18)	3 (3)	3.18	0.85	133	5 (4)	44 (33)	57 (43)	24 (18)	3 (2)	0.506
	v.	2.85	0.84	103	1 (1)	21 (20)	49 (48)	26 (25)	6 (6)	2.90	0.84	135	3 (2)	26 (19)	66 (49)	34 (25)	6 (4)	0.795
ID	i.	3.15	1.01	87	4 (5)	32 (37)	31 (36)	13 (15)	7 (8)	2.76	1.13	58	1 (2)	18 (31)	15 (26)	14 (24)	10 (17)	---
	ii.	2.70	0.92	87	1 (1)	13 (15)	43 (49)	19 (22)	11 (13)	2.34	1.02	58	1 (2)	6 (10)	19 (33)	18 (31)	14 (24)	---
	iii.	2.51	0.89	87	0 (0)	10 (11)	37 (43)	27 (31)	13 (15)	2.26	0.95	58	0 (0)	6 (10)	17 (29)	21 (36)	14 (24)	---
	iv.	2.51	0.99	87	1 (1)	12 (14)	33 (38)	25 (29)	16 (18)	2.26	1.02	58	0 (0)	8 (14)	15 (26)	19 (33)	16 (28)	---
	v.	2.39	0.93	87	0 (0)	9 (10)	34 (39)	26 (30)	18 (21)	2.10	0.93	58	0 (0)	4 (7)	16 (28)	20 (34)	18 (31)	---

Learning activities that teachers can promote students' capability in performing

i. Information search (e.g. using search engine)
ii. Information selection
iii. Information collation and analysis (e.g. using spreadsheet)
iv. Reporting and Presentation (e.g. PowerPoint and website presentation)
v. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/ learning records)
Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

Table 8.43b Therapists' perceived levels of agreement of promoting students' capability in performing different therapy/training activities with the use of IT ([E8]THQ13a)

Therapist types		MS1										MS2									
		Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option						
					Strongly agree		Agree		Neutral		Strongly disagree				Strongly agree		Agree		Neutral		Strongly disagree	
SPH	i.	2.09	0.94	11	0	(0)	0	(0)	5	(45)	2	(18)	4	(36)	2.33	1.00	9	0	(0)	1	(11)	3	(33)	3	(33)	2	(22)
	ii.	2.00	0.89	11	0	(0)	0	(0)	4	(36)	3	(27)	4	(36)	2.25	1.04	8	0	(0)	1	(13)	2	(25)	3	(38)	2	(25)
	iii.	1.82	0.75	11	0	(0)	0	(0)	2	(18)	5	(45)	4	(36)	2.13	0.83	8	0	(0)	0	(0)	3	(38)	3	(38)	2	(25)
	iv.	2.09	1.04	11	0	(0)	1	(9)	3	(27)	3	(27)	4	(36)	2.44	1.24	9	1	(11)	0	(0)	3	(33)	3	(33)	2	(22)
	v.	1.82	0.75	11	0	(0)	0	(0)	2	(18)	5	(45)	4	(36)	2.25	1.04	8	0	(0)	1	(13)	2	(25)	3	(38)	2	(25)
PHY	i.	1.67	0.82	6	0	(0)	0	(0)	1	(17)	2	(33)	3	(50)	2.14	1.21	7	0	(0)	1	(14)	2	(29)	1	(14)	3	(43)
	ii.	1.67	0.82	6	0	(0)	0	(0)	1	(17)	2	(33)	3	(50)	2.14	1.21	7	0	(0)	1	(14)	2	(29)	1	(14)	3	(43)
	iii.	1.67	0.82	6	0	(0)	0	(0)	1	(17)	2	(33)	3	(50)	2.00	1.15	7	0	(0)	1	(14)	1	(14)	2	(29)	3	(43)
	iv.	1.67	0.82	6	0	(0)	0	(0)	1	(17)	2	(33)	3	(50)	2.43	1.40	7	0	(0)	2	(29)	2	(29)	0	(0)	3	(43)
	v.	1.67	0.82	6	0	(0)	0	(0)	1	(17)	2	(33)	3	(50)	2.29	1.38	7	0	(0)	2	(29)	1	(14)	1	(14)	3	(43)
OC	i.	2.00	0.82	7	0	(0)	0	(0)	2	(29)	3	(43)	2	(29)	3.36	1.29	11	2	(18)	4	(36)	2	(18)	2	(18)	1	(9)
	ii.	2.14	1.07	7	0	(0)	1	(14)	1	(14)	3	(43)	2	(29)	3.00	1.00	11	0	(0)	4	(36)	4	(36)	2	(18)	1	(9)
	iii.	1.86	1.07	7	0	(0)	1	(14)	0	(0)	3	(43)	3	(43)	2.73	1.10	11	1	(9)	1	(9)	4	(36)	4	(36)	1	(9)
	iv.	2.00	1.00	7	0	(0)	1	(14)	0	(0)	4	(57)	2	(29)	2.55	1.13	11	1	(9)	1	(9)	2	(18)	6	(55)	1	(9)
	v.	2.14	1.07	7	0	(0)	1	(14)	1	(14)	3	(43)	2	(29)	2.91	1.04	11	0	(0)	4	(36)	3	(27)	3	(27)	1	(9)

Therapy/training activities that therapists can promote students' capability in performing

i. Information search (e.g. using search engine)
ii. Information selection
iii. Information collation and analysis (e.g. using spreadsheet)
iv. Reporting and Presentation (e.g. PowerPoint and website presentation)
v. Self-evaluation on learning outcomes (e.g. online tests/questionnaires/ learning records
Mean: 1="Strongly disagree" and 5="Strongly agree"

8.2.6 School Professional Development in ITEd for Teachers

School heads were satisfied with the sufficiency of teachers' ITEd professional development

School professional development is considered as one of the most important factors to promote ITEd in special schools. It is because effective development programmes are expected to enhance teachers' IT competency and facilitate teachers' development of a positive ITEd perception. In MS1, 89% and 82% of school heads were satisfied or very satisfied that teachers and therapists received sufficient professional development to enhance the quality of learning and teaching as well as the quality of therapy or training respectively. No statistically significant difference was observed in MS2 (Table 8.44, [E1-1/E1-2]HSQ4a, [E1-2]HSQ4c).

Table 8.44 School heads' levels of satisfaction with the sufficiency of teachers'/therapists' ITEd professional development ([E1-1]HSQ4a, [E1-2]HSQ4c)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option										*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"Teachers receive sufficient professional development to enhance the quality of learning and teaching "														
MS1	4.00	0.55	54	7	(13)	41	(76)	5	(9)	1	(2)	0	(0)	0.250
MS2	3.90	0.50	52	4	(8)	39	(75)	9	(17)	0	(0)	0	(0)	
"Therapists receive sufficient professional development to enhance the quality of therapy or training." (For [E1-2] only)														
MS1	3.84	0.52	45	2	(4)	35	(78)	7	(16)	1	(2)	0	(0)	0.983
MS2	3.81	0.70	43	4	(9)	30	(70)	6	(14)	3	(7)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Around half of the teachers had participated in ITEd professional development programmes in MS1

When teachers were asked about their actual participation in ITEd professional development programmes or activities in the 2004/05 and 2005/06 school years, around half of the teachers (50% of NC and 49% of ID) in MS1 as well as 46% and 36% of NC and ID teachers respectively in MS2 reported to have participated in the programmes or activities. No statistically significant difference was noted for NC teachers in MS2 (Table 8.45a, [E5]TQ22a).

When therapists were asked about their participation in ITEd professional development programmes or activities in the 2004/05 school year, 18% of SPH (n=2) and 14% of OC therapists (n=1) reported to have participated in the programmes or activities in MS1. 33% (n=3), 14% (n=1) and 18% (n=1) of SPH, PHY and OC therapists respectively participated in these programmes in MS2 (Table 8.45b, [E8]THQ20a).

Teachers tended to find the ITEd professional development programmes to be practical and they found that these programmes were quite sufficient (一般)

The teachers were also asked to evaluate the professional development programmes or activities in terms of sufficiency and practicality. 20% of both NC and ID teachers in MS1 as well as 19% and 27% respectively in MS2 perceived the provision to be sufficient or very sufficient. The mean ratings for NC and ID teachers were 3.05-3.07 (SD:0.57-0.65) and 3.07-3.14 (SD:0.62) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 8.46 [E5]TQ22h). 44% of NC and 55% of ID teachers in MS1 as well as 37% and 53% respectively in MS2 found the programmes or activities to be practical or very practical. The mean ratings for NC and ID teachers were 3.34-3.42 (SD:0.54-0.64) and 3.56-3.57 (SD:0.59-0.60) respectively on a scale of 1 to 5 where 1 was 'totally not practical' and 5 was 'very practical' (Table 8.46 [E5]TQ22f). No statistically significant difference was observed in MS2 in the practicality and sufficiency level of the professional

development programmes or activities for NC teachers.
Therapists were also asked to evaluate the sufficiency of the professional development programmes or activities. 20% (n=2), 17% (n=1) and none of SPH, PHY and OC therapists respectively in MS1 as well as 25% (n=2), none and 30% (n=3) respectively in MS2 perceived the provision to be sufficient or very sufficient. The mean ratings for SPH, PHY and OC therapists were 2.88-3.00 (SD:0.67-0.83), 2.67-3.00 (SD:0.00-0.81) and 2.86-3.00 (SD:0.38-0.94) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 8.46, [E8]THQ20c).

Teachers were positive about the outcomes of ITEd professional development programmes and around 70% of them anticipated future participation

Over 60% of the special school teachers agreed or strongly agreed that the programmes or activities enhanced their IT proficiency (NC=MS1: 81%, MS2: 70%; ID=MS1: 70%, MS2: 76%) and their capability in using IT for learning and teaching (NC=MS1: 75%, MS2: 70%; ID=MS1: 75%, MS2: 81%) as well as increased their interest in IT (NC=MS1: 62%, MS2: 58%; ID=MS1: 61%, MS2: 66%). No statistically significant difference was identified in MS2 for NC teachers (Tables 8.47, [E5]TQ22g.i-iii). 69% and 71% of NC and ID teachers respectively in MS1 indicated that they were willing or very willing to join such development programmes or activities, with mean ratings of 3.79 (SD:0.62) and 3.74 (SD:0.60) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. A statistically significant decrease was noted in the percentages of NC teachers who were willing or very willing to participate in these programmes in the future (from 69% to 61%) in MS2. 74% of ID teachers in MS2 were willing or very willing to do so (Table 8.46, [E5]TQ23).

Teachers' ITEd professional development programmes should focus on the IT application in subject or cross-curricular teaching and the use of new technology in teaching

When looking into teachers' expectations of the themes of professional development programmes or activities (Table 8.45a, [E5]TQ22i), the top two commonly selected themes were "IT application on subject or cross-curricular teaching" (NC=MS1: 74%, MS2: 68%; ID=MS1: 64%, MS2: 60%) and "use of new technology in teaching" (NC=MS1: 71%, MS2: 64%; ID=MS1: 64%, MS2: 71%). The next two popular themes were "IT application on project-based or cross-curricular learning" (NC=MS1=MS2: 63%; ID=MS1: 59%, MS2: 55%) and "webpage design" (NC=MS1: 45%, MS2: 40%; ID=MS1: 41%, MS2: 40%). As for the modes of professional development programmes or activities, more than 65% of the special school teachers expected these programmes or activities to be conducted more often in the modes of "training courses" (NC=MS1: 78%, MS2: 73%; ID=MS1: 74%, MS2: 69%) and "workshops" (NC=MS1=MS2: 70%; ID=MS1: 67%, MS2: 76%) (Table 8.45a, [E5]TQ22j). A statistically significant decrease was observed in the percentages of NC teachers choosing special lectures (from 53% to 27%) and seminars (from 31% to 18%) as the two expected modes for ITEd professional development programmes or activities in the future in MS2.

As for the themes of programmes or activities, the most common theme of the programmes or activities which the therapists wished to be included was "IT application on therapy or training" [SPH=MS1: 60% (n=6), MS2: 100% (n=8); PHY=MS1: 100%, MS2: 86% (n=6); OC=MS1: 71% (n=5), MS2: 90% (n=9)]. Other themes were chosen by different types of therapists such as "programming" by 50% of SPH therapists (n=5), "IT therapy or training resource management" by 83% of PHY (n=5) and 86% of OC therapists (n=6) in MS1 (Table 8.45b, [E8]THQ20d).

Table 8.45a Teachers' expectations and actual participation in the themes and modes of ITEd professional development programmes or activities ([E5]TQ22a,c,d,i,j)

Teachers' participation in teachers' ITEd professional development programme/activity	**Percentage (%) of Teachers choosing the options**									
	Expectation					**Actual participation**				
	NC			**ID**		**NC**			**ID**	
						MS1 (N=103)	**MS2 (N=136)**	***P*-value**	**MS1 (N=88)**	**MS2 (N=58)**
YES						50	46	0.454	49	36
NO						50	54		51	64
Themes of ITEd professional development programmes/activities	**MS1 (N=103)**	**MS2 (N=136)**	***P*-value**	**MS1 (N=88)**	**MS2 (N=58)**	**MS1 (N=52)**	**MS2 (N=62)**	***P*-value**	**MS1 (N=43)**	**MS2 (N=21)**
IT application on subject/cross-curricular teaching	74	68	0.305	64	60	69	70	0.989	70	67
Use of new technology in teaching[#]	71	64	0.262	64	71	-	-		-	-
IT application on project-based or cross-curricular learning	63	63	0.924	59	55	25	23	0.763	35	33
Webpage design[#]	45	40	0.443	41	40	-	-		-	-
IT facilities and digital resource management[#]	30	28	0.203	31	24	-	-		-	-
Computer operating skills/Basic computer operating skills	27	23	0.437	30	26	35	30	0.525	26	29
Network security	30	23	0.203	23	31	15	21	0.446	12	14
Programming[#]	25	20	0.322	31	29	-	-		-	-
Internet communication	-	-	-	-	-	33	18	0.066	12	14
Others(Please specify: _____)	1	1	0.732	0	0	6	8	0.634	9	0
Modes of ITEd professional development programmes/activities										
Training courses	78	73	0.390	74	69	71	56	0.107	60	48
Workshop	70	70	0.993	67	76	77	56	0.022*	49	62
Special lectures	53	27	0.000***	41	40	50	29	0.023*	30	33
Seminars	31	18	0.023*	18	17	33	34	0.895	40	38
Classroom observation and exchanges	31	24	0.193	15	19	12	11	0.967	5	0
Training camp	12	5	0.066	8	3	2	0	0.275	0	0
Others(Please specify: _____)	1	1	0.732	0	2	0	0	1.000	0	0

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

Multiple responses items. [#]Themes included in [E5]TQ22i only

Table 8.45b Therapists' expectations of the themes as well as actual participation in ITEd professional development programmes or activities ([E8]THQ20a,d)

Therapists' participation in therapists' ITEd professional development programme/activity	**Percentage (%)of Therapists choosing the option**					
	SPH		**PHY**		**OC**	
	MS1 (N=11)	**MS2 (N=9)**	**MS1 (N=6)**	**MS2 (N=7)**	**MS1 (N=7)**	**MS2 (N=10)**
YES	18	33	0	14	14	18
NO	82	67	100	86	86	82
Themes of ITEd professional development programmes/activities	**Percentage (%)of Therapists choosing the option**					
	SPH		**PHY**		**OC**	
	MS1 (N=10)	**MS2 (N=8)**	**MS1 (N=6)**	**MS2 (N=7)**	**MS1 (N=7)**	**MS2 (N=10)**
Computer Operating skills	20	0	33	0	29	30
Webpage design	40	13	67	29	43	20
Network security	0	0	17	0	43	50
Programming	50	13	33	0	29	40
IT application on therapy/ training	60	100	100	86	71	90
IT therapy/training resource management	40	38	83	29	86	60
Others: (Please specify: _____)	0	0	0	0	0	0

Table 8.46 Teachers' levels of sufficiency, practicality and willingness for future participation and therapists' perception of the sufficiency of ITEd professional development programmes or activities ([E5]TQ22f,h,23, [E8]THQ20c)

Special school types/ Stakeholders	MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very practical	Practical	Slightly practical (一般)	Not practical	Totally not practical				Very practical	Practical	Slightly practical (一般)	Not practical	Totally not practical	
Levels of practicality Mean: 1="Totally not practical" and 5="Very practical"																	
NC Teachers	3.42	0.64	52	1 (2)	22 (42)	28 (54)	0 (0)	1 (2)	3.34	0.54	62	0 (0)	23 (37)	37 (60)	2 (3)	0 (0)	0.376
ID Teachers	3.56	0.59	45	1 (2)	23 (53)	18 (42)	1 (2)	0 (0)	3.57	0.60	37	1 (5)	10 (48)	10 (48)	0 (0)	0 (0)	---
	MS1 Mean (1-5)	SD	N	Count (%) of Teachers/Therapists choosing the option					MS2 Mean (1-5)	SD	N	Count (%) of Teachers/Therapists choosing the option					*P*-value
				Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient				Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient	
Levels of sufficiency Mean: 1="Totally insufficient" and 5="Very sufficient"																	
NC Teachers	3.07	0.65	103	1 (1)	20 (19)	69 (67)	11 (11)	2 (2)	3.05	0.57	131	0 (0)	25 (19)	88 (67)	18 (14)	0 (0)	0.758
ID Teachers	3.07	0.62	88	0 (0)	18 (20)	60 (68)	8 (9)	2 (2)	3.14	0.62	56	0 (0)	15 (27)	34 (61)	7 (13)	0 (0)	---
SPH	3.00	0.67	10	0 (0)	2 (20)	6 (60)	2 (20)	0 (0)	2.88	0.83	8	0 (0)	2 (25)	3 (38)	3 (38)	0 (0)	---
PHY	2.67	0.81	6	0 (0)	1 (17)	2 (33)	3 (50)	0 (0)	3.00	0.00	7	0 (0)	0 (0)	7 (100)	0 (0)	0 (0)	---
OC	2.86	0.38	7	0 (0)	0 (0)	6 (86)	1 (14)	0 (0)	3.00	0.94	10	0 (0)	3 (30)	5 (50)	1 (10)	1 (10)	---
	MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
				Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing				Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	
Levels of willingness for future participation Mean: 1="Totally not willing" and 5="Very willing"																	
NC Teachers	3.79	0.62	102	11 (11)	59 (58)	32 (31)	0 (0)	0 (0)	3.56	0.69	135	3 (2)	79 (59)	45 (33)	6 (4)	2 (1)	0.026*
ID Teachers	3.74	0.60	85	5 (6)	55 (65)	23 (27)	2 (2)	0 (0)	3.82	0.57	57	5 (9)	37 (65)	15 (26)	0 (0)	0 (0)	---

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.47 Teachers' levels of agreement on the outcomes obtained from the ITEd professional development programmes or activities ([E5]TQ22g.i-iii)

Special school types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
					Strongly agree	Agree	Neutral	Disagree	Strongly disagree				Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
NC	i.	3.62	0.82	52	5 (10)	27 (52)	16 (31)	3 (6)	1 (2)	3.53	0.65	62	1 (2)	35 (56)	22 (35)	4 (6)	1 (2)	0.461
	ii.	3.88	0.58	52	5 (10)	37 (71)	9 (17)	1 (2)	0 (0)	3.69	0.53	62	1 (2)	42 (68)	18 (29)	1 (2)	0 (0)	0.061
	iii.	3.83	0.62	52	5 (10)	34 (65)	12 (23)	1 (2)	0 (0)	3.65	0.63	62	1 (2)	42 (68)	15 (24)	4 (6)	0 (0)	0.181
ID	i.	3.70	0.77	43	6 (14)	20 (47)	15 (35)	2 (5)	0 (0)	3.81	0.68	21	3 (14)	11 (52)	7 (33)	0 (0)	0 (0)	---
	ii.	3.74	0.76	43	5 (12)	25 (58)	10 (23)	3 (7)	0 (0)	3.90	0.62	21	3 (14)	13 (62)	5 (24)	0 (0)	0 (0)	---
	iii.	3.81	0.70	43	5 (12)	27 (63)	9 (21)	2 (5)	0 (0)	3.95	0.59	21	3 (14)	14 (67)	4 (19)	0 (0)	0 (0)	---

Outcomes

i. Increase your interest in IT

ii. Enhance your IT proficiency

iii. Enhance your capability in using IT for learning and teaching

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.2.7 School ITEd Sharing and Collaboration among Teachers

Teachers tended to agree that they would share their teaching experience in using IT or teaching materials with colleagues and the others, but they perceived themselves having a lower level of capability to share their experience in promoting ITEd with the education community

Teachers' and therapists' ITEd perception can be further illustrated by their involvement and capabilities to work collaboratively and share good practices with other teachers and therapists. 40% and 48% of NC as well as 31% and 41% of ID teachers in MS1 and MS2 respectively indicated that they were incapable or totally incapable of sharing their experience in promoting ITEd with the education community whereas 16% and 14% of NC as well as 14% and 12% of ID teachers in MS1 and MS2 respectively rated themselves as capable or very capable to do so. The mean ratings for NC and ID teachers were 2.54-2.72 (SD:0.81-0.93) and 2.59-2.73 (SD:0.82-0.86) respectively on a scale of 1 to 5 where 1 was 'totally not capable' and 5 was 'very capable'. No statistically significant difference was noted in NC teachers' perceived level of capability to share their experience in promoting ITEd with the education community in MS2 (Table 8.48a, [E5]TQ29).

When teachers and therapists were asked about their views on ITEd collaboration and sharing, there was an evidence of relatively active participation. 53% and 55% of NC as well as 67% and 61% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that they would work collaboratively with their colleagues in promoting ITEd. The mean ratings for NC and ID teachers were 3.46-3.51 (SD:0.68-0.76) and 3.68-3.71 (SD:0.62-0.64) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 8.48a, [E5]TQ18a). 67% and 70% of NC as well as 71% and 68% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that they would share their experience on pedagogical use of IT with colleagues and the others. The mean ratings for NC and ID teachers were 3.73-3.74 (SD:0.61-0.63) and 3.72-3.73 (SD:0.58-0.61) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 8.48a, [E5]TQ18b). No statistically significant difference was observed in NC teachers' level of agreement on ITEd collaboration and sharing in MS2.

As for therapists, 54% (n=6), 67% (n=4) and 14% (n=1) of SPH, PHY and OC therapists in MS1 respectively as well as 63% (n=5), 43% (n=3) and 36% (n=4) of SPH, PHY and OC therapists in MS2 indicated that they were incapable or totally incapable of sharing their experience in promoting IT in therapy or training to the therapy or training community. The mean ratings for SPH, PHY and OC therapists were 2.25-2.27 (SD:1.01-1.04), 2.00-2.43 (SD:1.13-1.26) and 2.45-3.00 (SD:0.82-1.00) respectively on a scale of 1 to 5 where 1 was 'totally not capable' and 5 was 'very capable' in MS1 (Table 8.48b, [E8]THQ26). When they were asked about their views on ITEd collaboration and sharing, there was an evidence of relatively active participation by OC therapists and some participation by SPH and PHY therapists in MS1. 36% (n=4), 33% (n=2) and 71% (n=5) of SPH, PHY and OC therapists in MS1 respectively as well as 38% (n=3), 33% (n=2) and 60% (n=6) of SPH, PHY and OC therapists respectively in MS2 agreed and strongly agreed that they would work collaboratively with their colleagues in promoting IT in therapy or training. The mean ratings for SPH, PHY and OC were 2.82-3.38 (SD:0.52-1.25), 3.17 (SD:0.75) and 3.50-3.86 (SD:0.69-0.71) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 8.48b, [E8]THQ17a). 55% (n=6), 33% (n=2) and all (n=7) of SPH, PHY and OC therapists respectively in MS1 as well as 44% (n=4), 57% (n=4) and 60% (n=6) respectively in MS2 agreed or strongly agreed that they would share their experience on using IT in therapy or training and therapy or training materials with colleagues and the others. The mean ratings for SPH, PHY and OC were 3.18-3.56 (SD:0.73-1.17), 3.17-3.43 (SD:0.75-0.79) and 3.60-4.14 (SD:0.38-0.84) respectively (Table 8.48b, [E8]THQ17b).

Table 8.48a Teachers' involvement and capabilities to work collaboratively and share good practices with other teachers ([E5]TQ18a,b,29)

Special school types		MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	*P*-value
Types of ITEd collaboration and sharing (Mean: 1="Strongly disagree" and 5="Strongly agree")																		
NC	a.	3.51	0.68	103	5 (5)	49 (48)	43 (42)	6 (6)	0 (0)	3.46	0.76	136	5 (4)	69 (51)	47 (35)	14 (10)	1 (1)	0.843
	b.	3.74	0.61	102	8 (8)	60 (59)	33 (32)	1 (1)	0 (0)	3.73	0.63	135	8 (6)	86 (64)	38 (28)	2 (1)	1 (1)	0.878
ID	a.	3.68	0.62	87	3 (3)	56 (64)	26 (30)	1 (1)	1 (1)	3.71	0.64	59	6 (10)	30 (51)	23 (39)	0 (0)	0 (0)	---
	b.	3.72	0.58	87	4 (5)	57 (66)	24 (28)	2 (2)	0 (0)	3.73	0.61	59	4 (7)	36 (61)	18 (31)	1 (2)	0 (0)	---

Special school types	MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable	*P*-value
Capabilities of sharing their experience in promoting IT culture with the education community (Mean: 1="Totally not capable" and 5="Very capable")																	
NC	2.72	0.81	103	1 (1)	15 (15)	46 (45)	36 (35)	5 (5)	2.54	0.93	136	2 (1)	17 (13)	52 (38)	47 (35)	18 (13)	0.138
ID	2.73	0.82	86	0 (0)	12 (14)	47 (55)	19 (22)	8 (9)	2.59	0.86	58	0 (0)	7 (12)	27 (47)	17 (29)	7 (12)	---

Types of ITEd collaboration and sharing

a. You will work collaboratively with your colleagues in promoting ITEd

b. You will share your teaching experience on using IT or teaching materials with colleagues and the other

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.48b Therapists' involvement and capabilities to work collaboratively and share good practices with other therapists ([E8]THQ17a,b,26)

Therapists types		MS1 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Types of ITEd collaboration and sharing (Mean: 1="Strongly disagree" and 5="Strongly agree")																	
SPH	a.	2.82	1.25	11	0 (0)	4 (36)	4 (36)	0 (0)	3 (27)	3.38	0.52	8	0 (0)	3 (38)	5 (63)	0 (0)	0 (0)
	b.	3.18	1.17	11	0 (0)	6 (55)	3 (27)	0 (0)	2 (18)	3.56	0.73	9	1 (11)	3 (33)	5 (56)	0 (0)	0 (0)
PHY	a.	3.17	0.75	6	0 (0)	2 (33)	3 (50)	1 (17)	0 (0)	3.17	0.75	6	0 (0)	2 (33)	3 (50)	1 (17)	0 (0)
	b.	3.17	0.75	6	0 (0)	2 (33)	3 (50)	1 (17)	0 (0)	3.43	0.79	7	0 (0)	4 (57)	2 (29)	1 (14)	0 (0)
OC	a.	3.86	0.69	7	1 (14)	4 (57)	2 (29)	0 (0)	0 (0)	3.50	0.71	10	0 (0)	6 (60)	3 (30)	1 (10)	0 (0)
	b.	4.14	0.38	7	1 (14)	6 (86)	0 (0)	0 (0)	0 (0)	3.60	0.84	10	1 (10)	5 (50)	3 (30)	1 (10)	0 (0)

Therapists types	MS1 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable	MS2 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very capable	Capable	Quite capable (一般)	Not capable	Totally not capable
Capabilities of sharing their experience in promoting IT culture with the education community (Mean: 1="Totally not capable" and 5="Very capable")																
SPH	2.27	1.01	11	0 (0)	1 (9)	4 (36)	3 (27)	3 (27)	2.25	1.04	8	0 (0)	1 (13)	2 (25)	3 (38)	2 (25)
PHY	2.00	1.26	6	0 (0)	1 (17)	1 (17)	1 (17)	3 (50)	2.43	1.13	7	0 (0)	1 (14)	3 (43)	1 (14)	2 (29)
OC	3.00	1.00	7	0 (0)	2 (29)	4 (57)	0 (0)	1 (14)	2.45	0.82	11	0 (0)	0 (0)	7 (64)	2 (18)	2 (18)

Types of ITEd collaboration and sharing

a. You will work collaboratively with your colleagues in promoting ITEd

b. You will share your teaching experience on using IT or teaching materials with colleagues and the other

8.2.8 Areas for Improvement of ITEd Development

Teachers tended to agree that the use of IT increased teaching workload and the design of general classrooms was unsuitable for the use of IT in teaching

Teachers may encounter difficulties or obstacles when using IT in learning and teaching. These concerns should be taken into account the areas for improvement of ITEd development. The perception of the difficulties or obstacles in using IT for teaching as discussed in Section 8.2.3 may indicate some of the obstacles which hinder the development of ITEd. 39%-57% of the teachers (NC=MS1: 53%, MS2: 57%; ID=MS1: 42%, MS2: 39%) agreed or strongly agreed that the use of IT increased teaching workload. The unsuitable design of general classrooms for the use of IT in teaching was another problem agreed or strongly agreed by 49% and 51% of NC as well as 33% and 34% of ID teachers in MS1 and MS2 respectively. 28% and 32% of NC as well as 23% and 27% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that students' concentration would be distracted when using computers for individual or small-group learning. Lack of direction and understanding of how IT fits into the overall education policy is another factor affecting the effective use of IT. 36% and 39% of NC as well as 23% and 26% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that their schools lacked concrete and effective scheme to promote ITEd. No statistically significant difference was noted for NC teachers in MS2 (Table 8.33a, [E5]TQ16g-j).

As for therapists, the perception of the difficulties or obstacles in using IT for therapy or training as discussed in Section 8.2.3 may indicate some of the obstacles which hinder the development of ITEd. In MS1, the unsuitable design of general therapy/training site for the use of IT in teaching was the major problem agreed or strongly agreed by 45% of SPH (n=5), 67% of PHY (n=4) and 58% of OC therapists (n=4). 57% of OC therapists (n=4) agreed or strongly agreed that the school was in lack of concrete and effective scheme to promote IT in therapy or training. In MS2, the major problem was lack of concrete and effective scheme to promote IT in therapy/training in schools as indicated by 55% of SPH (n=5); "the use of IT increases therapy/training workload" by 72% of PHY (n=5); "the design of general therapy/training site is unsuitable for the use of IT in therapy/training" by 64% of OC therapists (n=7) (Table 8.33b, [E8]THQ15g-j).

Top three areas for improvement of ITEd development in Hong Kong as perceived by teachers were teachers' workload reduction, increase of IT experts or professionals in schools and the provision of digital resources for learning purposes

Teachers put up their views on the areas for improvement of ITEd development in Hong Kong. Majority of them agreed or strongly agreed that ITEd development could be better if the following could be achieved: increase in IT experts or professionals in schools (NC=MS1: 77%, MS2: 82%; ID=MS1: 78%, MS2: 71%), increase in the provision of digital resources for learning purposes (NC=MS1=MS2: 78%; ID=MS1: 78%, MS2: 75%), increase in IT facilities, digital resources or funding for the development of ITEd in schools (NC=MS1=MS2=75%; ID=MS1: 74%, MS2: 71%) and increase in teachers' ITEd professional development activities or opportunities (NC=MS1: 77%, MS2: 81%; ID=MS1=MS2: 73%). In addition, 77% and 83% of NC as well as 76% and 74% of ID teachers in MS1 and MS2 respectively agreed or strongly agreed that workload reduction was another area for improvement of ITEd development in Hong Kong. All of the above items had mean ratings over 3.90 on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. No statistically significant difference was observed in the improvement areas of ITEd development for NC teachers in Hong Kong in MS2 (Table 8.49a, [E5]TQ21a-f).

Therapists put up their views on the areas for improvement of the development of IT in therapy or training in Hong Kong. In MS1, majority of PHY and OC therapists agreed or strongly agreed that the development of IT in therapy or training could be better if the following could be achieved: increase in the provision of digital resources for therapy or training purposes [83% of PHY (n=5) and 100% of OC (n=7)], increase in IT facilities, digital resources or funding for the development of ITEd in school [83% of PHY (n=5) and 85% of OC (n=6)], increase in therapists' ITEd professional development activities or opportunities [83% of PHY (n=5) and 100% of OC (n=7)], and workload reduction [83% of PHY (n=5) and 86% of OC (n=6)]. 83% of PHY therapists (n=5) agreed or strongly agreed that increase in IT experts or professionals in school was another area for improvement of the development of IT in therapy or training in Hong Kong. Around half of SPH therapists (n=5-6) agreed or strongly agreed that the aforementioned areas should be improved except for workload reduction. In MS2, all SPH therapists (n=9) agreed or strongly agreed to the following areas for improvement: "Increase IT facilities/digital resources/funding for the development of ITEd in school", "Increase the provision of digital resources for learning purposes" and "Increase teachers'/therapists' ITEd professional development activities/ opportunities". 71% of PHY therapists (n=5) agreed or strongly agreed to "Increase the provision of digital resources for learning purposes". All OC therapists (n=11) agreed or strongly agreed to "Increase IT facilities/digital resources/funding for the development of ITEd in school". (Table 8.49b, [E8]THQ19a-f). Again, these figures must be interpreted with caution due to the small sample size.

Table 8.49a Teachers' views on the areas for improvement of ITEd development in Hong Kong ([E5]TQ21a-f)

Special school types	Improve-ment areas	MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	*P*-value
NC	a.	4.04	0.74	103	30 (29)	47 (46)	26 (25)	0 (0)	0 (0)	3.96	0.69	136	29 (21)	74 (54)	32 (24)	1 (1)	0 (0)	0.442
	b.	4.06	0.73	103	30 (29)	49 (48)	24 (23)	0 (0)	0 (0)	4.07	0.68	135	35 (26)	75 (56)	24 (18)	1 (1)	0 (0)	0.912
	c.	4.14	0.75	103	37 (36)	43 (42)	23 (22)	0 (0)	0 (0)	3.99	0.66	136	29 (21)	77 (57)	30 (22)	0 (0)	0 (0)	0.107
	d.	4.03	0.69	103	26 (25)	54 (52)	23 (22)	0 (0)	0 (0)	3.98	0.67	136	25 (18)	86 (63)	23 (17)	1 (1)	1 (1)	0.686
	e.	4.20	0.82	103	46 (45)	33 (32)	23 (22)	1 (1)	0 (0)	4.21	0.77	135	53 (39)	60 (44)	20 (15)	1 (1)	1 (1)	0.948
	f.	3.36	0.67	11	1 (9)	2 (18)	8 (73)	0 (0)	0 (0)	3.40	0.91	15	1 (7)	6 (40)	7 (47)	0 (0)	1 (7)	0.610 [c.]
ID	a.	3.99	0.83	87	25 (29)	39 (45)	21 (24)	1 (1)	1 (1)	3.95	0.74	58	14 (24)	27 (47)	17 (29)	0 (0)	0 (0)	---
	b.	4.06	0.78	87	26 (30)	42 (48)	18 (21)	0 (0)	1 (1)	3.93	0.88	58	16 (28)	25 (43)	15 (26)	1 (2)	1 (2)	---
	c.	4.03	0.80	86	25 (29)	42 (49)	17 (20)	1 (1)	1 (1)	4.00	0.77	58	16 (28)	27 (47)	14 (24)	1 (2)	0 (0)	---
	d.	3.94	0.78	87	21 (24)	43 (49)	20 (23)	3 (3)	0 (0)	3.98	0.74	58	15 (26)	27 (47)	16 (28)	0 (0)	0 (0)	---
	e.	4.15	0.79	87	34 (39)	32 (37)	21 (24)	0 (0)	0 (0)	4.07	0.88	58	21 (36)	22 (38)	14 (24)	0 (0)	1 (2)	---
	f.	2.82	0.98	11	0 (0)	2 (18)	7 (64)	0 (0)	2 (18)	2.75	1.26	4	0 (0)	1 (25)	2 (50)	0 (0)	1 (25)	---

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [c.] Mann-Whitney U Test (1-tailed Sig.)

Table 8.49b Therapists' views on the areas for improvement of ITEd development of IT in therapy/training in Hong Kong ([E8]THQ19a-f)

Therapist types	Improve-ment areas	MS1 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree
SPH	a.	3.36	1.03	11	1 (9)	4 (36)	5 (45)	0 (0)	1 (9)	4.22	0.44	9	2 (22)	7 (78)	0 (0)	0 (0)	0 (0)
	b.	3.36	1.03	11	1 (9)	4 (36)	5 (45)	0 (0)	1 (9)	4.11	0.60	9	2 (22)	6 (67)	1 (11)	0 (0)	0 (0)
	c.	3.45	1.13	11	2 (18)	3 (27)	5 (45)	0 (0)	1 (9)	4.11	0.33	9	1 (11)	8 (89)	0 (0)	0 (0)	0 (0)
	d.	3.45	1.04	11	1 (9)	5 (45)	4 (36)	0 (0)	1 (9)	4.11	0.33	9	1 (11)	8 (89)	0 (0)	0 (0)	0 (0)
	e.	3.00	0.89	11	1 (9)	0 (0)	9 (82)	0 (0)	1 (9)	4.22	0.83	9	4 (44)	3 (33)	2 (22)	0 (0)	0 (0)
	f.	2.33	1.15	3	0 (0)	0 (0)	2 (67)	0 (0)	1 (33)	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
PHY	a.	4.17	0.75	6	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	3.57	0.79	7	1 (14)	2 (29)	4 (57)	0 (0)	0 (0)
	b.	4.17	0.75	6	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	3.71	0.76	7	1 (14)	3 (43)	3 (43)	0 (0)	0 (0)
	c.	4.17	0.75	6	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	3.86	0.69	7	1 (14)	4 (57)	2 (29)	0 (0)	0 (0)
	d.	4.17	0.75	6	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	3.71	0.76	7	1 (14)	3 (43)	3 (43)	0 (0)	0 (0)
	e.	4.17	0.75	6	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	3.57	0.79	7	1 (14)	2 (29)	4 (57)	0 (0)	0 (0)
	f.	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3.00	0.00	2	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)
OC	a.	4.00	0.58	7	1 (14)	5 (71)	1 (14)	0 (0)	0 (0)	4.27	0.47	11	3 (27)	8 (73)	0 (0)	0 (0)	0 (0)
	b.	3.43	1.40	7	2 (29)	1 (14)	3 (43)	0 (0)	1 (14)	4.18	0.75	11	4 (36)	5 (45)	2 (18)	0 (0)	0 (0)
	c.	4.29	0.49	7	2 (29)	5 (71)	0 (0)	0 (0)	0 (0)	4.00	0.47	10	1 (10)	8 (80)	1 (10)	0 (0)	0 (0)
	d.	4.43	0.53	7	3 (43)	4 (57)	0 (0)	0 (0)	0 (0)	4.18	0.60	11	3 (27)	7 (64)	1 (9)	0 (0)	0 (0)
	e.	4.14	0.69	7	2 (29)	4 (57)	1 (14)	0 (0)	0 (0)	4.09	0.83	11	4 (36)	4 (36)	3 (27)	0 (0)	0 (0)
	f.	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4.00	0.00	2	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)

Improvement areas

a. Increase IT facilities/digital resources/funding for the development of ITEd in school
b. Increase IT experts/professionals in school
c. Increase the provision of digital resources for learning purposes
d. Increase teachers'/therapists' ITEd professional development activities/opportunities
e. Reduce teachers'/therapists' workload so that they can have more time to develop ITEd
f. Others (Please specify: _____)

Mean: 1="Strongly disagree" and 5="Strongly agree"

8.3 Enhancing School Leadership for the Knowledge Age

The third strategic goal is 'Enhancing school leadership for the knowledge age". The objective of this goal is to equip school heads with leadership capacities so that they can provide teachers with guidance and support for establishing schools' IT culture. The progress made under each of the following areas in this goal is examined:

- School ITEd Plan
- Activities to promote IT culture
- Resources and support
- School professional development in ITEd for school heads
- School heads' willingness to promote ITEd

8.3.1 School ITEd Plan

School heads were satisfied with their school ITEd plans and they perceived a higher level of satisfaction with their school ITEd plans which stated clear visions and goals as well as covered the infrastructure requirements of schools

In MS1, as shown in Table 8.50 ([E1-1/E1-2]HSQ5a-g), school heads showed great satisfaction with their school ITEd plans. 82% of school heads were satisfied or very satisfied that clear visions and goals were stated in the school ITEd plan. 78% of them were satisfied or very satisfied with the ITEd plan which covered the infrastructure requirements of schools while 76% of them were satisfied or very satisfied that the implementation strategies and action plans were clearly listed in the school ITEd plan. 74% and 67% of school heads were satisfied or very satisfied with their school ITEd plans which covered teachers' ITEd professional development as well as the content or measures of integrating IT into learning and teaching respectively. 72% of school heads also were satisfied or very satisfied that teachers understood and participated in the school ITEd plan. 69% of school heads were satisfied or very satisfied that their schools would implement and evaluate the effectiveness of the ITEd plans seriously. The mean ratings ranged from 3.70 to 3.91 (SD:0.55-0.68) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was noted in school heads' satisfaction level with school ITEd plans in MS2.

The most important goal in formulating school ITEd plans was to enhance learning and teaching effectiveness

In relation to the importance of different goals setting in the formulation of school ITEd plans (Table 8.51, [E2-1/E2-2]HQ1a-n), most of school heads regarded improving students' learning outcomes (98%), providing suitable learning activities to cater for individual students' needs (97%), enhancing learning and teaching effectiveness (96%) and enhancing students' understanding of subject content (92%) as important or very important goals in the formulation of school ITEd plans in MS1. The next four important goals were improving students' therapy or training outcomes (89%), promoting learning through assessment (87%), enhancing students' understanding of therapy or training content (85%) and strengthening students' initiative, independence and sense of responsibility in learning (83%). The above items had mean ratings greater than 4.00 on a scale from 1 to 5 where 1 represented 'totally not important' and 5 represented 'very important'. Around 75% of them indicated that strengthening or developing students' generic skills such as analytical skills, creativity and collaborative skills (78%) as well as fostering students' information literacy including information-processing skills and attitude (76%) were other important goals, with mean ratings of

3.97 (SD:0.65) and 3.88 (SD:0.80) respectively on a scale from 1 to 5 where 1 represented ‘totally not important’ and 5 represented ‘very important’. The goals which were rated as relatively less important were improving communication and co-operation among schools, parents and community (69%), integrating related topics for studies and promoting collaboration amongst different subjects (64%), providing training to prepare students for further studies or careers (64%) as well as meeting the expectations of parents and the community (62%), with mean ratings between 3.64 and 3.78 (SD:0.64-1.02) on a scale from 1 to 5 where 1 represented ‘totally not important’ and 5 represented ‘very important’. No statistically difference was found in school heads’ perceived level of the importance of different goals in formulating school ITEd plans in MS2.

Table 8.50 School heads' levels of satisfaction with the school ITEd plan ([E1-1/E1-2]HSQ5a-g)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		
a.	3.91	0.68	54	7	(13)	37	(69)	9	(17)	0 (0)	1 (2)	3.92	0.59	52	7	(13)	34	(65)	11	(21)	0 (0)	0 (0)	0.873
b.	3.70	0.60	54	3	(6)	33	(61)	17	(31)	1 (2)	0 (0)	3.88	0.51	52	4	(8)	38	(73)	10	(19)	0 (0)	0 (0)	0.105
c.	3.87	0.55	54	5	(9)	37	(69)	12	(22)	0 (0)	0 (0)	4.02	0.54	52	8	(15)	37	(71)	7	(13)	0 (0)	0 (0)	0.162
d.	3.76	0.55	54	2	(4)	38	(70)	13	(24)	1 (2)	0 (0)	3.83	0.62	52	5	(10)	34	(65)	12	(23)	1 (2)	0 (0)	0.571
e.	3.83	0.61	54	5	(9)	36	(67)	12	(22)	1 (2)	0 (0)	3.81	0.56	52	4	(8)	34	(65)	14	(27)	0 (0)	0 (0)	0.728
f.	3.70	0.66	54	3	(6)	34	(63)	16	(30)	0 (0)	1 (2)	3.75	0.59	52	4	(8)	31	(60)	17	(33)	0 (0)	0 (0)	0.924
g.	3.80	0.56	54	4	(7)	35	(65)	15	(28)	0 (0)	0 (0)	3.79	0.57	52	4	(8)	33	(63)	15	(29)	0 (0)	0 (0)	0.934

Aspects related to the school ITEd Plan

a. Clear vision and goal are stated in the school ITEd plan.
b. The school ITEd plan covers the content/measures of integrating IT into teaching and learning.
c. The school ITEd plan covers the infrastructure requirements of the school.
d. The school ITEd plan covers teachers' ITEd professional development.
e. The school ITEd plan clearly lists out implementation strategies and action plans.
f. The school will implement and evaluate the effectiveness of the ITEd plan seriously.
g. Teachers understand and participate in the school ITEd plan.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.51 School heads' perception of the importance of different goals in formulating school ITEd plan ([E2-1/E2-2]HQ1a-n)

Goals	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very important		Important		Quite important (一般)		Not important				Very important		Important		Quite important (一般)		Not important		
a.	4.53	0.54	58	32	(55)	25	(43)	1	(2)	0 (0)	0 (0)	4.52	0.58	52	29	(56)	21	(40)	2	(4)	0 (0)	0 (0)	0.970
b.	4.26	0.64	47	17	(36)	25	(53)	5	(11)	0 (0)	0 (0)	4.39	0.54	44	18	(41)	25	(57)	1	(2)	0 (0)	0 (0)	0.372
c.	4.57	0.57	58	35	(60)	21	(36)	2	(3)	0 (0)	0 (0)	4.52	0.58	52	29	(56)	21	(40)	2	(4)	0 (0)	0 (0)	0.633
d.	4.12	0.53	58	12	(21)	41	(71)	5	(9)	0 (0)	0 (0)	4.19	0.60	52	15	(29)	32	(62)	5	(10)	0 (0)	0 (0)	0.470
e.	4.04	0.59	47	9	(19)	31	(66)	7	(15)	0 (0)	0 (0)	4.11	0.62	44	11	(25)	27	(61)	6	(14)	0 (0)	0 (0)	0.564
f.	4.03	0.62	58	12	(21)	36	(62)	10	(17)	0 (0)	0 (0)	4.23	0.58	52	16	(31)	32	(62)	4	(8)	0 (0)	0 (0)	0.096
g.	3.97	0.65	58	11	(19)	34	(59)	13	(22)	0 (0)	0 (0)	4.10	0.60	52	12	(23)	33	(63)	7	(13)	0 (0)	0 (0)	0.279
h.	4.29	0.25	58	19	(33)	37	(64)	2	(3)	0 (0)	0 (0)	4.29	0.28	52	19	(37)	29	(56)	4	(8)	0 (0)	0 (0)	0.934
i.	3.69	1.01	58	9	(16)	28	(48)	17	(29)	2 (3)	2 (3)	3.96	1.00	52	14	(27)	28	(54)	5	(10)	4 (8)	1 (2)	0.054
j.	3.69	1.02	58	8	(14)	29	(50)	16	(28)	5 (9)	0 (0)	3.85	1.02	52	7	(13)	31	(60)	13	(25)	1 (2)	0 (0)	0.347
k.	3.88	0.80	58	10	(17)	34	(59)	11	(19)	3 (5)	0 (0)	3.98	0.82	52	11	(21)	31	(60)	9	(17)	0 (0)	1 (2)	0.446
l.	3.78	0.65	58	6	(10)	34	(59)	17	(29)	1 (2)	0 (0)	3.81	0.77	52	8	(15)	29	(56)	12	(23)	3 (6)	0 (0)	0.674
m	4.07	0.59	58	12	(21)	38	(66)	8	(14)	0 (0)	0 (0)	4.15	0.64	52	14	(27)	33	(63)	4	(8)	1 (2)	0 (0)	0.369
n	3.64	0.64	58	3	(5)	33	(57)	20	(34)	2 (3)	0 (0)	3.69	0.67	52	6	(12)	24	(46)	22	(42)	0 (0)	0 (0)	0.899

Goals

a. To improve students' learning outcomes
b. To improve students' therapy/training outcomes (For [E2-2] only)
c. To enhance learning and teaching effectiveness
d. To enhance students' understanding of subject content
e. To enhance students' understanding of therapy/training content (For [E2-2] only)
f. To strengthen students' initiative, independence and sense of responsibility in learning
g. To strengthen/develop students' generic skills (e.g. analytical skills, creativity, collaboration skills)
h. To provide suitable learning activities according to the needs of individual student
i. To provide training so as to prepare students for further studies/future careers
j. To integrate related topics for studies and promote collaboration amongst different subjects
k. To foster students' information literacy, including information-processing skills and attitude
l. To improve communication and cooperation among school, parents and community
m. To promote learning through assessment
n. To meet the expectations of parents and the community

Mean: 1="Totally not important" and 5="Very important"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The top priority for school ITEd plans for the 2005/06 and 2006/07 school years was to improve students' use of IT in their learning

When asked about the three most important options to which schools gave priority to when setting ITEd plans for the 2005/06 and 2006/07 school years (Table 8.52, [E2-1/E2-2]HQ4), a relatively high percentage of school heads in MS1 chose the options of improving students' use of IT in their learning (79%) as well as improving digital resources and IT infrastructure in schools (64%) as the top two priorities in the development of ITEd plans within their schools in MS1. Other important goals were promoting the development of ITEd and building up the culture on the use of IT in school (38%), improving the implementation and evaluation of school ITEd plan (36%) as well as strengthening teachers' professional development on ITEd knowledge and its application (34%). Striving for support from the community to initiate ITEd and encouraging parents' participation in relevant activities (5%) as well as strengthening therapists' professional development on ITEd knowledge and its application (4%) were the two least important priorities in school ITEd plans among the listed priorities. A statistically significant decrease was observed in the percentage of school heads choosing the priority of "to improve students' use of IT in their learning" (from 79% to 60%) in MS2.

Table 8.52 The priorities of school ITEd plan for the 2005/06 and 2006/07school years (E2-1/E2-2]HQ4)

Priorities	Percentage (%)		*P*-value
	MS1 (N=58)	MS2 (N=52)	
To improve students' use of IT in their learning	79	60	0.025*
To improve digital resources and the IT infrastructure in school	64	52	0.210
To promote the development of ITEd and build up the culture on the use of IT in school	38	33	0.568
To improve the implementation and evaluation of school ITEd Plan	36	48	0.210
To strengthen teachers' professional development on ITEd knowledge and its application	34	37	0.823
To improve ITEd curriculum# in school	24	33	0.322
To improve students' use of IT in their therapy/training *(For [E2-2] only)*	17	30	0.159
To strive for community support to initiate ITEd and encourage parents' participation in relevant activities	5	10	0.373
To strengthen therapists' professional development on ITEd knowledge and its application *(For [E2-2] only)*	4	5	0.947
Others: (Please specify)	2	0	0.344

Three most important options; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd curriculum refers to the application of IT in learning and teaching in each KLA (including computer/IT curriculum), to develop IT skills, and to foster the development of information literacy (information processing skills and attitude) and generic skills (e.g. collaboration skill and creativity etc.).

Teachers tended to perceive the Computer or IT curriculum as sufficient in supporting teachers to facilitate students' use of IT in learning

When teachers were asked about the adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning, 37% of NC and 42% of ID teachers in MS1 indicated that the curriculum was sufficient and very sufficient while 33% and 36% respectively in MS2 considered the curriculum as sufficient. The mean ratings for NC and ID teachers were 3.16-3.26 (SD:0.73-0.74) and 3.28-3.38 (SD:0.63-0.67) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was observed for NC teachers in MS2 (Table 8.53a [E5]TQ26).

As for the therapists, 9% of SPH (n=1), 17% of PHY (n=1) and 14% of OC therapists (n=1) in MS1 indicated that the Computer or IT curriculum was sufficient and very sufficient to facilitate students' use of IT in therapy or training. 33% (n=3), 14% (n=1) and 36% (n=4) of SPH, PHY and OC therapists respectively in MS2 considered the curriculum as sufficient. The mean ratings for SPH, PHY and OC were 2.91-3.11 (SD:0.70-0.78), 2.83-2.86 (SD:0.69-0.75) and 3.00-3.18 (SD:0.75-1.00) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. Therapists perceived that the Computer or IT curriculum was quite sufficient (一般) (Table 8.53b [E8]THQ23).

ITEd Team teachers tended to have considerable participation in encouraging teachers/therapists to make appropriate use of IT in teaching/therapy or training, but they tended to have some participation in exchanging experience and insight on the use of IT in teaching with other schools/regions/countries when implementing school ITEd plans

The ITEd Team teachers' perceived levels of participation in different tasks when implementing ITEd plan is further explored. Surveyed ITEd Team teachers reported that they participated in all tasks to some extent with mean ratings of 3.05-3.40 (SD:0.73-1.24) for MS1 and 3.03-3.77 (SD: 0.75-1.09) for MS2 on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation' (Table 8.54, [E4-1/E-4-2]ITQ3a-n) except for the task of exchanging experience and insight on the use of IT in teaching with other schools/regions/countries [only 23% in MS1 and 22% in MS2 had considerable or strong participation with mean ratings of 2.50 (SD:1.11) and 2.71 (SD:1.13) respectively]. The four tasks in which most of the ITEd team teachers rated themselves as having considerable or strong participation were encouraging other teachers/therapists to make appropriate use of IT in teaching/therapy or training (MS1: 53%, MS2: 62%), formulating school-based ITEd plan (MS1: 51%, MS2: 67%), providing ITEd professional development to therapists (MS1: 50%, MS2: 60%), and coordinating all matters related to ITEd in schools (MS1: 48%, MS2: 61%). Around two-fifths of them had considerable or strong participation in providing technical support for teachers/therapists for the use of IT in teaching/therapy or training (MS1: 43%, MS2: 58%), setting clear objectives and guidelines on IT infrastructure for schools (MS1: 43%, MS2: 58%), providing ITEd professional development to teachers (MS1: 41%, MS2: 54%), enhancing the fostering of information literacy in Computer/IT curriculum (MS1: 40%, MS2: 42%) and across the KLAs (MS1: 38%, MS2: 25%).

The three major problems encountered by school heads in the implementation of ITEd plans were lack of suitable educational software or digital resources, insufficient assistive devices and teachers' / therapists' heavy workload

School heads' perceived difficulties or obstacles to the implementation of ITEd plan are reported in Table 8.55 ([E2-1/E2-2]HQ3a-n). Among the listed difficulties, the top three problems often or most often encountered by schools in the implementation of ITEd plans in MS1 were teachers'/therapists' heavy workload (31%), insufficient assistive devices (36%) and the lack of suitable educational software or digital resources (45%). 21% and 24% of school heads respectively perceived that they often or most often encountered the problem of "insufficient computer rooms" and "insufficient IT facilities (e.g. computers and Internet facilities)" when implementing of ITEd plans while 60% and 50% of them respectively perceived that they rarely or never encountered this problem. 74% of school heads rarely or never encountered a lack of clear objective in adopting IT in learning and teaching as well as a lack of a concrete plan to encourage teachers to promote ITEd. No statistically significant difference was noted in school heads' perceived frequency of the difficulties encountered in the implementation of ITEd plans in MS2.

From ITEd team teachers' point of view, the top two difficulties that they frequently or very frequently encountered were insufficient IT facilities in school (46%), insufficient IT facilities and digital resources from the EMB (41%) in MS1. The top two difficulties in MS2 were "insufficient IT facilities and digital resources from the EMB" (45%) and other teachers' insufficient time to adopt IT in teaching (39%) (Table 8.56, [E4-1/4-2]ITQ4a-k).

Table 8.53a Teachers' perception of the levels of adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning ([E5]TQ26)

Tasks	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							Mean (1-5)	SD	N	Count (%) of Teachers choosing the option							
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient									
Adequacy of Computer or IT curriculum in supporting teachers to facilitate students' use of IT in learning																					
NC	3.26	0.74	103	3	(3)	35	(34)	52	(50)	12 (12)	1 (1)		3.16	0.73	135	0	(0)	45	(33)	69	(51)	18 (13)	3 (2)	0.379
ID	3.38	0.63	87	1	(1)	36	(41)	46	(53)	3 (3)	1 (1)		3.28	0.67	58	0	(0)	21	(36)	34	(59)	1 (2)	2 (3)	---

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.53b Therapists' perception of the levels of adequacy of Computer or IT curriculum in supporting therapists to facilitate students' use of IT in therapy/training ([E8]THQ23)

Tasks	MS1										MS2									
	Mean (1-5)	SD	N	Count (%) of Therapists choosing the option							Mean (1-5)	SD	N	Count (%) of Therapists choosing the option						
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient								
Adequacy of Computer or IT curriculum in supporting therapists to facilitate students' use of IT in therapy/training																				
SPH	2.91	0.70	11	0	(0)	1	(9)	9	(82)	0 (0)	1 (9)		3.11	0.78	9	0	(0)	3	(33)	4	(44)	2 (22)	0 (0)
PHY	2.83	0.75	6	0	(0)	1	(17)	3	(50)	2 (33)	0 (0)		2.86	0.69	7	0	(0)	1	(14)	4	(57)	2 (29)	0 (0)
OC	3.00	1.00	7	1	(14)	0	(0)	4	(57)	2 (29)	0 (0)		3.18	0.75	11	0	(0)	4	(36)	5	(45)	2 (18)	0 (0)

Mean: 1="Totally insufficient" and 5="Very sufficient"

Table 8.54 ITEd Team teachers' perceived levels of participation in different tasks when implementing school ITEd plan ([E4-1/E4-2]ITQ3a-n)

Tasks	MS1												MS2											
	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option									Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option								
				Strong participation		Considerable participation		Some participation (一般)		Little participation		None				Strong participation		Considerable participation		Some participation (一般)		Little participation		None	
a.	3.35	1.23	40	7	(18)	13	(33)	12	(30)	3	(8)	5	(13)	3.77	0.92	31	6	(19)	15	(48)	8	(26)	1	(3)	1	(3)
b.	3.13	1.24	40	5	(13)	12	(30)	12	(30)	5	(13)	6	(15)	3.52	1.00	31	4	(13)	14	(45)	8	(26)	4	(13)	1	(3)
c.	3.13	1.09	40	3	(8)	13	(33)	14	(35)	6	(15)	4	(10)	3.58	0.96	31	6	(19)	10	(32)	11	(35)	4	(13)	0	(0)
d.	3.20	1.18	40	4	(10)	15	(38)	11	(28)	5	(13)	5	(13)	3.65	0.91	31	5	(16)	14	(45)	8	(26)	4	(13)	0	(0)
e.	3.40	0.87	40	2	(5)	19	(48)	13	(33)	5	(13)	1	(3)	3.65	0.75	31	3	(10)	16	(52)	10	(32)	2	(6)	0	(0)
f.	3.35	0.92	40	4	(10)	13	(33)	17	(43)	5	(13)	1	(3)	3.58	0.89	31	4	(13)	14	(45)	9	(29)	4	(13)	0	(0)
g.	3.18	0.93	40	1	(3)	15	(38)	17	(43)	4	(10)	3	(8)	3.35	0.98	31	2	(6)	15	(48)	7	(23)	6	(19)	1	(3)
h.	3.40	0.97	10	1	(10)	4	(40)	3	(30)	2	(20)	0	(0)	3.60	0.91	15	2	(13)	7	(47)	4	(27)	2	(13)	0	(0)
i.	3.10	1.01	40	2	(5)	13	(33)	15	(38)	7	(18)	3	(8)	3.35	0.98	31	2	(6)	15	(48)	7	(23)	6	(19)	1	(3)
j.	3.15	0.92	40	3	(8)	9	(23)	21	(53)	5	(13)	2	(5)	3.29	0.97	31	3	(10)	11	(35)	9	(29)	8	(26)	0	(0)
k.	3.05	1.06	40	3	(8)	11	(28)	14	(35)	9	(23)	3	(8)	3.23	1.09	31	2	(6)	13	(42)	9	(29)	4	(13)	3	(10)
l.	2.50	1.11	40	1	(3)	8	(20)	9	(23)	14	(35)	8	(20)	2.71	1.13	31	2	(6)	5	(16)	11	(35)	8	(26)	5	(16)
m.	3.25	0.90	40	2	(5)	14	(35)	18	(45)	4	(10)	2	(5)	3.23	0.88	31	1	(3)	12	(39)	12	(39)	5	(16)	1	(3)
n	3.33	0.73	40	2	(5)	13	(33)	21	(53)	4	(10)	0	(0)	3.03	0.91	31	2	(6)	6	(19)	15	(48)	7	(23)	1	(3)

Tasks

a. To participate in formulating the school-based ITEd plan in school
b. To set clear objectives and guidelines on IT infrastructure for school
c. To make recommendations to school on the allocation and use of IT facilities and digital resources
d. To co-ordinate all matters related to ITEd in school
e. To encourage teachers/therapists to make appropriate use of IT in teaching/therapy or training
f. To provide technical support to teachers/therapists for the use of IT in teaching/therapy or training
g. To provide ITEd professional development to teachers
h. To provide ITEd professional development to therapists (For [E4-2] only)
i. To drive the school to become an exemplary model of making use of IT in teaching and learning
j. To explore new technology (e.g. wireless network system) and develop innovative teaching methods
k. To research and evaluate on the effectiveness of ITEd in school
l. To exchange experience and insight on the use of IT in teaching with other schools/ regions/countries
m. To enhance the fostering of information literacy (e.g. information-processing skills and attitude) in Computer/IT curriculum
n. To enhance the fostering of information literacy (e.g. information-processing skills and attitude) across the key learning areas

Mean: 1= "None" and 5="Strong participation"

Table 8.55 School heads' perceived frequency of difficulties encountered in implementing of ITEd plan ([E2-1/E2-2]HQ3a-n)

	MS1											MS2											*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option								Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Most often		Often		Occasionally (間中)		Rarely		Never				Most often		Often		Occasionally (間中)		Rarely		Never	
a.	2.95	1.07	58	4	(7)	14	(24)	20	(34)	15	(26)	5	(9)	2.81	1.03	52	5	(10)	3	(6)	26	(50)	13	(25)	5	(10)	0.406
b.	2.22	0.86	58	0	(0)	5	(9)	14	(24)	28	(48)	11	(19)	2.12	0.65	52	0	(0)	0	(0)	14	(27)	30	(58)	8	(15)	0.646
c.	2.10	0.79	58	0	(0)	2	(3)	15	(26)	28	(48)	13	(22)	2.02	0.73	52	0	(0)	1	(2)	11	(21)	28	(54)	12	(23)	0.586
d.	2.59	0.84	58	1	(2)	6	(10)	23	(40)	24	(41)	4	(7)	2.38	0.95	52	2	(4)	2	(4)	19	(37)	20	(38)	9	(17)	0.209
e.	2.57	0.77	58	0	(0)	5	(9)	28	(48)	20	(34)	5	(9)	2.37	0.77	52	0	(0)	3	(6)	19	(37)	24	(46)	6	(12)	0.145
f.	2.64	0.97	47	2	(4)	5	(11)	19	(40)	16	(34)	5	(11)	2.39	0.95	44	0	(0)	5	(11)	16	(36)	14	(32)	9	(20)	0.281
g.	2.29	0.77	58	0	(0)	2	(3)	22	(38)	25	(43)	9	(16)	2.19	0.84	52	0	(0)	2	(4)	18	(35)	20	(38)	12	(23)	0.523
h.	2.03	0.79	58	0	(0)	2	(3)	13	(22)	28	(48)	15	(26)	1.88	0.73	52	0	(0)	1	(2)	8	(15)	27	(52)	16	(31)	0.322
i.	2.10	0.79	58	0	(0)	3	(5)	12	(21)	31	(53)	12	(21)	2.04	0.84	52	1	(2)	1	(2)	10	(19)	27	(52)	13	(25)	0.586
j.	2.45	0.82	58	0	(0)	6	(10)	20	(34)	26	(45)	6	(10)	2.37	0.93	52	1	(2)	4	(8)	17	(33)	21	(40)	9	(17)	0.566
k.	2.40	1.27	58	5	(9)	7	(12)	11	(19)	18	(31)	17	(29)	2.52	1.41	52	8	(15)	4	(8)	11	(21)	13	(25)	16	(31)	0.741
l.	2.60	1.20	58	4	(7)	10	(17)	15	(26)	17	(29)	12	(21)	2.62	1.14	52	2	(4)	10	(19)	17	(33)	12	(23)	11	(21)	0.870
m.	3.00	1.18	58	7	(12)	14	(24)	14	(24)	18	(31)	5	(9)	3.04	0.95	52	3	(6)	14	(27)	18	(35)	16	(31)	1	(2)	0.813
n.	3.45	1.05	58	12	(21)	14	(24)	20	(34)	12	(21)	0	(0)	3.38	0.99	52	8	(15)	14	(27)	21	(40)	8	(15)	1	(2)	0.822

Difficulties

a. The workload of teachers/therapists is so heavy that they cannot afford time to apply IT in their teaching/ therapy or training
b. Teachers/Therapists lack ITEd knowledge/skills in applying IT in teaching/therapy or training
c. Teachers/Therapists lack interest in using IT
d. The time which teachers need to prepare teaching materials with IT or participate in related ITEd professional development activities affects their teaching
e. The current teachers' professional development programs cannot foster/develop the requisite IT skills for teachers
f. The current therapists' professional development programs cannot foster/develop the requisite IT skills for therapists (For [E2-2] only)
g. The existing curriculum is not conducive to the use of IT for teaching in class.
h. The school does not have a clear objective in adopting IT in teaching and learning
i. The school is in lack of concrete plan to encourage teachers to promote ITEd
j. Insufficient technical support in school
k. Insufficient computer rooms
l. Insufficient IT facilities (e.g. computers and Internet facilities)
m. Insufficient assistive devices
n. Lacking in suitable educational software/digital resources

Mean: 1= "Never" and 5="Most often"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.56 ITEd Team teachers' perceived frequency of difficulties encountered in promoting ITEd ([E4-1/E4-2]ITQ4a-k)

	MS1											MS2										
	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option								Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option							
				Very Frequently		Frequently		Occasionally (間中)		Rarely					Very Frequently		Frequently		Occasionally (間中)		Rarely	
a.	2.65	1.00	40	2	(5)	6	(15)	11	(28)	18	(45)	3	(8)	2.29	0.82	31	0	(0)	3	(10)	7	(23)	17	(55)	4	(13)
b.	2.23	0.83	40	0	(0)	4	(10)	7	(18)	23	(58)	6	(15)	2.16	1.07	31	1	(3)	2	(6)	8	(26)	10	(32)	10	(32)
c.	2.60	0.84	40	1	(3)	4	(10)	15	(38)	18	(45)	2	(5)	2.23	0.92	31	0	(0)	3	(10)	8	(26)	13	(42)	7	(23)
d.	3.25	0.98	40	3	(8)	15	(38)	12	(30)	9	(23)	1	(3)	2.90	1.19	31	4	(13)	4	(13)	12	(39)	7	(23)	4	(13)
e.	3.23	0.92	40	5	(13)	7	(18)	20	(50)	8	(20)	0	(0)	2.84	1.37	31	4	(13)	7	(23)	7	(23)	6	(19)	7	(23)
f.	2.68	0.89	40	1	(3)	5	(13)	17	(43)	14	(35)	3	(8)	2.45	0.93	31	0	(0)	4	(13)	11	(35)	11	(35)	5	(16)
g.	2.40	0.84	40	0	(0)	3	(8)	16	(40)	15	(38)	6	(15)	2.19	0.83	31	0	(0)	1	(3)	11	(35)	12	(39)	7	(23)
h.	2.75	1.06	40	4	(10)	4	(10)	12	(30)	18	(45)	2	(5)	3.35	0.98	31	5	(16)	7	(23)	13	(42)	6	(19)	0	(0)
i.	2.70	0.82	40	1	(3)	5	(13)	16	(40)	17	(43)	1	(3)	3.03	0.87	31	2	(6)	6	(19)	14	(45)	9	(29)	0	(0)
j.	2.73	0.91	40	1	(3)	7	(18)	14	(35)	16	(40)	2	(5)	2.58	1.03	31	2	(6)	2	(6)	12	(39)	11	(35)	4	(13)
k.	3.30	0.88	40	3	(8)	13	(33)	18	(45)	5	(13)	1	(3)	3.19	1.01	31	2	(6)	12	(39)	8	(26)	8	(26)	1	(3)

Difficulties

a. The school does not have a clear direction in developing ITEd
b. The school is not enthusiastic enough in promoting ITEd
c. The school is in lack of implementation plan which co-ordinates the work of the ITEd team
d. There are insufficient IT facilities in school
e. I do not have sufficient time to cope with the work of ITEd team
f. My IT knowledge/skills is/are inadequate to deal with work of ITEd team
g. Other team members lack a sense of involvement in ITEd works
h. Other teachers in school do not have sufficient time to adopt IT in teaching
i. Teachers generally lack knowledge/skills in applying IT in teaching
j. Teachers generally lack interest in using IT in teaching
k. There are insufficient IT facilities and digital resources from Education and Manpower Bureau

Mean: 1="Never" and 5="Very frequently"

8.3.2 Activities to Promote IT Culture

School heads were satisfied with the collaborative team work and sharing among teachers in the use of IT for teaching in schools

81% of them were satisfied or very satisfied that their schools continuously promoted collaborative team work and sharing among teachers in the use of IT for teaching in MS1. There was no statistically significant difference between MS1 and MS2 (Table 8.57, [E1-1/ E1-2]HSQ8d).

Table 8.57 School heads' levels of satisfaction with IT culture in schools ([E1-1/E1-2]HSQ8d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school continuously promotes collaborative team work and sharing among teachers on the use of IT for teaching."									
MS1	3.87	0.55	54	4 (7)	40 (74)	9 (17)	1 (2)	0 (0)	0.836
MS2	3.87	0.53	52	4 (8)	37 (71)	11 (21)	0 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

45% of schools organised sharing activities on the use of IT for teaching and 77% of those schools that collaborated with outside parties organised these activities with local schools in MS1

Table 8.58 ([E2-1/E2-2]HQ17a-d) reports the situation of sharing activities on the use of IT for teaching in special schools. In MS1, 45% of school heads indicated that their schools had organised sharing activities for pedagogical use of IT in the 2004/05 school year ([E2-1/E2-2]HQ17a). Amongst the 52% of school heads who had organised sharing activities with outside parties ([E2-1/E2-2]HQ17b), 77% organised with local primary, secondary and special schools, 31% with local tertiary institutions, 15% with local community or commercial organisations and the EMB ([E2-1/E2-2]HQ17c). The sharing activities were conducted in the forms of workshops (68%), school visits (56%), training courses (44%) and seminars (40%). Only 36% of these schools provided online Internet resources for sharing with other schools and 12% participated in the activities of "Teacher sharing forum" at the HKEdCity ([E2-1/E2-2]HQ17d). There was no statistically significant difference between MS1 and MS2 in this area.

Table 8.58 School heads' report on the sharing activities on the use of IT for teaching in their schools in the 2004/05 and 2005/06 school years ([E2-1/E2-2]HQ17a-d)

Sharing activities	**Percentage (%)**		***P*-value**
	MS1 (N=56)	**MS2 (N=52)**	
YES	45	48	0.722
NO	55	52	
Collaboration with other organisations	**(N=25)**	**(N=25)**	
YES	52	40	0.399
NO	48	60	
Organisations	**(N=13)**	**(N=10)**	
Local primary, secondary, and special schools	77	90	0.605 [c]
Local tertiary institutions	31	10	0.410 [c]
Education and Manpower Bureau	15	50	0.166 [c]
Local community/commercial organisations	15	30	0.563 [c]
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	8	0	0.784 [c]
Oversea schools/community organisations/commercial organisations/tertiary institutions	0	0	1.000 [c]
Experience sharing activities	**(N=25)**	**(N=21)**	
Arranged workshop	68	76	0.543
Arranged school visits	56	29	0.064
Arranged training courses	44	52	0.575
Arranged seminars	40	33	0.644
Provided online Internet resources for sharing with other schools	36	33	0.852
Participated in the activities of "Teacher sharing forum" at HKEdCity	12	14	0.821
Issued publications	4	5	0.901

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001. [c.] Mann-Whitney U Test (1-tailed Sig.)

8.3.3 Resources and Support

School heads were satisfied that their schools made appropriate use of resources

In MS1, all school heads were satisfied or very satisfied that their schools made appropriate use of IT facilities and digital resources from the EMB, the Quality Education Fund and other sources. There was no statistically significant difference between MS1 and MS2 (Table 8.59, [E1-1/E1-2]HSQ6j)

Table 8.59 School heads' levels of satisfaction with the use of resources ([E1-1/E1-2]HSQ6j)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school makes appropriate use of IT facilities and digital resources from Education and Manpower Bureau, Quality Education Fund and other sources."									
MS1	4.17	0.38	54	9 (17)	45 (83)	0 (0)	0 (0)	0 (0)	0.398
MS2	4.08	0.55	52	10 (19)	36 (69)	6 (12)	0 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

A statistically significant increase from 51% in MS1 to 78% in MS2 was noted in the percentage of schools receiving funding from the Quality Education Fund for IT-related projects

In order to provide resources and support for the implementation of school ITEd plans, special schools might need ITEd grants or funding from various sources. In MS1, schools received funding from the Quality Education Fund for IT-related projects (51%), Millennium Multi-media Classrooms Project (5%) and from other parties (13%) (Table 8.60, [E3]ITEdInfoQ2a). In MS2, there was a statistically significant increase in the percentage of schools receiving funding from the Quality Education Fund for IT-related projects (from 51% to 78%).

Table 8.60 Types of ITEd funding received by schools ([E3]ITEdInfoQ2a)

ITEd Funding	Percentage (%)		*P*-value
	MS1 (N=55)	MS2 (N=36)	
a. Quality Education Fund:			
- IT-related Projects [excluding Information Technology Co-ordinator (ITC), Multi-media Learning Centre (MMLC) and Matching Fund*]	51	78	0.010*
- Millennium Multi-media Classrooms Project (千禧多媒體課室計劃)	5	11	0.325
b. Others	13	19	0.388

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

* Enhancement of IT facilities/services in school (matching fund)

School heads tended to be satisfied with the current funding model of the "Composite Information Technology Grant" and ITEd Team Teachers were quite satisfied (一般) with this model

53% and 48% of school heads as well as 25% and 16% of the ITEd Team teachers in MS1 and MS2 respectively were satisfied or very satisfied with the current funding model of the "Composite Information Technology Grant" (CITG) provided by the Government to support ITEd. The mean ratings for school heads and ITEd Team teachers were 3.35-3.38 (SD:0.88-0.89) and 2.87-3.10 (SD:0.67-0.72) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was identified in the satisfaction level of school heads in MS2 (Table 8.61, [E2-1/E2-2]HQ5, [E4-1/E4-2]ITQ6).

Table 8.61 School heads' and ITEd Team teachers' levels of satisfaction to the current funding model of "Composite Information Technology Grant" (CITG) provided by the Government to support ITEd ([E2-1/E2-2]HQ5, [E4-1/E4-2]ITQ6)

Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
School heads	MS1	3.38	0.89	58	3	(5)	28	(48)	16	(28)	10	(17)	1	(2)	0.768
	MS2	3.35	0.88	52	3	(6)	22	(42)	18	(35)	8	(15)	1	(2)	
ITEd team teachers	MS1	3.10	0.67	40	0	(0)	10	(25)	25	(63)	4	(10)	1	(3)	---
	MS2	2.87	0.72	31	0	(0)	5	(16)	18	(58)	7	(23)	1	(3)	

Mean: 1="Totally not satisfied" and 5="Very satisfied" Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.3.4 School Professional Development in ITEd for School Heads

School professional development programmes, such as IT leadership training for school principals organised by the EMB, help school heads to develop their positive perception of ITEd and empower them to build their knowledge, skills and understanding of learning and teaching with IT.

45% of school heads participated in ITEd professional development programmes or activities

In MS1, 45% of school heads reported having participated in ITEd professional development programmes or activities specifically organised for school heads. No statistically significant difference was noted in MS2 (Table 8.62, [E2-1/E2-2]HQ18a).

"Using IT in school administration or managerial work" was the major theme that school heads expected for ITEd professional development programmes or activities

When asked about their expectation of the themes of professional development programmes or activities (Table 8.62, [E2-1/E2-2]HQ18c), 84% of school heads in MS1 considered that using IT in school administration or managerial work should be included in these programmes. The next three themes were using new technology in teaching (64%), the formulation of school-based ITEd plan (55%) as well as IT facilities and digital resources management (50%). 36% of them indicated that the theme of using IT in subject or cross-curricular teaching should be incorporated. The theme of computer operation skills was selected by the lowest proportion of school heads amongst the specified themes (9%). No statistically significant difference was noted in MS2. As for the modes of professional development programmes or activities, the three most desirable modes rated by school heads in MS1 were workshops (84%), training courses (72%) and school visits (69%) ([E2-1/2-2]HQ18d). In MS2, a statistically significant decrease (from 84% to 65%) was identified in the percentage of school heads who chose "workshops" to be the desirable mode for ITEd professional development programmes or activities.

Table 8.62 School heads' expectations of the themes and modes as well as participation in ITEd professional development programmes or activities ([E2-1/E2-2]HQ18a,c,d)

School heads' participation in school heads' ITEd professional development programme/activity	Percentage (%)		*P*-value
	MS1 (N=45)	MS2 (N=52)	
YES	45	44	0.966
NO	55	56	
Themes of ITEd professional development programmes/activities	**Expectation (N=58)**	**Expectation (N=52)**	
Use of IT in school administration/management work	84	73	0.093
Formulation of school-based ITEd plan	55	57	0.950
Use of new technology in teaching	64	53	0.210
Use of IT in subject/cross-curricular teaching	36	31	0.549
IT facilities and digital resources management	50	49	0.841
Computer operation skills	9	16	0.275
Others: (Please specify)	2	4	0.260
Modes of ITEd professional development programmes/activities	**Expectation (N=58)**	**Expectation (N=52)**	
Workshops	84	65	0.021*
Training courses	72	71	0.884
School visits	69	63	0.544
Special lectures	50	46	0.688
Seminars	29	35	0.553
Training camps	22	12	0.134
Others: (Please specify)	0	2	0.291

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

School heads considered ITEd professional development programmes as effective in helping their teaching, administration and managerial work

In MS1, 80% of school heads reported the ITEd professional development programmes as effective or very effective in helping their teaching, administration and managerial work, with a mean rating of 3.85 (SD:0.46) on a scale of 1 to 5 where 1 was 'totally not effective' and 5 was 'very effective'. No statistically significant difference was noted in MS2 (Table 8.63, [E2-1/E2-2]HQ18b).

Table 8.63 School heads' perception of the effectiveness of the ITEd professional development programmes or activities ([E2-1/E2-2]HQ18b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very effective	Effective	Quite effective (一般)	Not very effective	Totally not effective	
MS1	3.85	0.46	25	1 (4)	19 (76)	5 (20)	0 (0)	0 (0)	0.269
MS2	3.65	0.78	23	3 (13)	10 (43)	9 (39)	1 (4)	0 (0)	

Mean: 1="Totally not effective" and 5="Very effective"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.3.5 School Heads' Willingness to Promote ITEd

School heads were willing to allocate more time to promote ITEd

As school heads play a leading role in the promotion of ITEd in schools, their levels of willingness to allocate more time in this respect is surveyed. In MS1, it was found that 87% of school heads were willing or very willing to do so, with a mean rating of 4.05 (SD:0.63) on a scale of 1 to 5 where 1 was 'not willing at all' and 5 was 'very willing'. There was no statistically significant difference between MS1 and MS2 on school heads' level of willingness to allocate more time to promote ITEd (Table 8.64, [E2-1/E2-2]HQ6).

Table 8.64 School heads' levels of willingness to allocate more time to promote ITEd ([E2-1/E2-2]HQ6)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very willing	Willing	Quite willing (一般)	Not willing	Not willing at all	
MS1	4.05	0.63	58	12 (21)	38 (66)	7 (12)	1 (2)	0 (0)	0.950
MS2	4.08	0.52	52	9 (17)	38 (73)	5 (10)	0 (0)	0 (0)	

Mean: 1="Totally not effective" and 5="Very effective"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.4 Enriching Digital Resources for Learning

The fourth strategic goal is "Enriching digital resources for learning". This strategy aims to continually enrich quality digital education resources to meet schools' needs and develop the digital resource repository with effective knowledge management strategies to facilitate learning, teaching and sharing among teachers, parents, students and other schools.

The usefulness of digital resources with respect to meeting the learning and teaching needs is reflected by the types of digital resources that are available, the frequency of usage and the ways in which these resources are managed. The following aspects will be examined:

- Sources of digital resources
- Digital resources repository

8.4.1 Sources of Digital Resources

School heads were satisfied that their schools acquired up-to-date digital resources for teachers and students' use

School heads' levels of satisfaction with enriching digital resources for learning is presented in Table 8.65 ([E1-1/E1-2]HSQ6a-c). In MS1, 77% of school heads were satisfied or very satisfied with the acquisition of up-to-date digital resources for teachers' and students' use. Half of school heads were satisfied or very satisfied that their schools derived an effective digital resource management mechanism to facilitate learning and teaching as well as sharing among teachers, parents and students. 41% of them were satisfied or very satisfied that their schools developed quality school-based digital resources and a repository of online resources for all KLAs. The mean ratings of these three items fell in the range of 3.37 to 3.81 (SD:0.62-0.64) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was found in school heads' level of satisfaction with all aspects mentioned above in MS2.

School heads considered the digital resources produced by teachers/therapists and the free digital resources downloaded from the Internet (except the HKEdCity) as the two most important sources

School heads' perception of the importance of different sources of digital resources for learning and teaching/therapy or training is presented in Table 8.66 ([E2-1/E2-2]HQ9a-j). In MS1, the three most important sources of digital resources perceived by school heads were those produced by teachers/therapists (78%), free digital resources downloaded from the Internet (except the HKEdCity) (78%) and those purchased by schools (77%). 70% to 75% of school heads indicated the digital resources from the HKEdCity (75%) and those obtained from the Quality Education Fund (70%) as important or very important. 53% and 34% of them considered the digital resources purchased by means of the electronic Learning Credits or obtained via community resources such as from publishers and IT industries as important or very important. All of the above items had mean ratings in MS1 ranged from 3.24 to 3.98 (SD:0.63-1.07) on a scale of 1 to 5 where 1 was 'totally not important' and 5 was 'very important'. No statistically significant difference was noted in MS2.

The two most common digital resources which NC teachers used frequently or very frequently were those purchased by their schools and those provided by textbook publishers whereas ID teachers used those developed by themselves and schools frequently or very frequently

When looking at the frequency of teachers using different digital resources (Table 8.67a, [E5]TQ10a.i-xi), the two most common resources which NC teachers used frequently or very frequently were purchased by their schools (44%) and provided by textbook publishers (41%), as reported in MS1. It was followed by free resources downloaded from the Internet (34%), resources from the HKEdCity (33%) and those developed by other software vendors (26%). All other digital resources were frequently or very frequently used by less than 24% of NC teachers, with mean ratings less than 3.00 on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. 21% and 23% of NC teachers frequently or very frequently used the digital resources developed by themselves and the EMB respectively. No statistically significant difference was noted in the usage of digital resources by NC teachers in MS2. For ID teachers, the most common resources which ID teachers used frequently or very frequently were developed by themselves (MS1: 46%, MS2: 50%), followed by those developed by schools (MS1: 40%, MS2: 30%), free resources downloaded from the Internet (MS1: 37%, MS2: 35%), those from the HKEdCity (MS1: 36%; MS2: 32%) and those purchased by schools (MS1: 29%, MS2: 25%). All other digital resources were frequently or very frequently used by less than 21% of ID teachers, with mean ratings less than 2.80 on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. 18% of ID teachers in both MS1 and MS2 as well as 13% and 11% of ID teachers in MS1 and MS2 respectively frequently or very frequently used the digital resources developed by the EMB and other government departments or voluntary organisations respectively. 4% and 6% of ID teachers in MS1 and MS2 respectively frequently or very frequently used the digital resources provided by textbook publishers.

As for therapists, they rarely used digital resources (Table 8.67b, [E8]THQ9a.i-xi). In MS1, only 36% of SPH therapists (n=4) frequently or very frequently used the digital resources developed by themselves and free resources downloaded from the Internet. All other digital resources were frequently or very frequently used by less than 30% of the therapists (n=1-2) in MS1 and MS2, with mean ratings less than 3.00 on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently'. In MS1, 17% of PHY (n=1) and 14% of OC therapists (n=1) frequently or very frequently used the resources purchased by their schools and those developed by themselves respectively. In MS2, 22% of SPH therapists (n=2) very frequently used those resources purchased by their schools. 29% and 28% of PHY therapists (n=2) frequently or very frequently used those resources developed by themselves and by their schools. 27% of OC therapists (n=3) frequently used free resources downloaded from the Internet. These figures must be interpreted with caution due to the small sample size.

The most common digital resources assigned by NC teachers in both MS1 and MS2 for learning subject knowledge or used by students in MS2 on their own initiative for self-learning beyond school hours were free resources downloaded from the Internet while ID teachers in both MS1 and MS2 and students in MS1 often used self-made digital resources by teachers for these purposes

Table 8.68a ([E5]TQ10d) shows the sources of digital resources assigned by teachers for students to learn subject knowledge beyond school hours. ID teachers used self-made digital resources more frequently (NC=MS1: 18%, MS2: 12%; ID=MS1: 47%, MS2: 83%) while NC teachers used free digital resources downloaded from the Internet (except HKEdCity) more frequently (NC=MS1: 53%, MS2: 45%; ID: MS1: 40%, MS2: 39%). Other common digital resources assigned for students as reported by teachers were those from the HKEdCity (NC=MS1: 40%, MS2: 38%; ID=MS1: 40%, MS2: 39%) and those purchased by schools (NC=MS1: 49%, MS2: 38%; ID=MS1: 20%, MS2: 11%). No statistically significant difference was noted for NC teachers in MS2.

Students were asked to indicate the sources of digital resources that they used on their own initiative for self-learning beyond school hours (Table 8.68a, [E6-1]SQ10c, [E6-2/E6-3]SQ11c, [E6-4/E6-5/E6-6]SQ13c). In MS1, students used teachers' self-made digital resources (35% of NC and 66% of ID) most frequently. In MS2, students used free digital resources downloaded from the Internet (except HKEdCity) most frequently [39% of NC (n=22)of 92% of ID (n=11)]. Other common digital resources used by students for self-learning purposes beyond school hours were those from the HKEdCity (NC=MS1: 27%, MS2: 30%; ID=MS1: 41%, MS2: 58%). No statistically significant difference was noted for NC students in MS2.

With regard to the digital resources assigned by therapists for students to conduct therapy/training beyond school hours, as reported in MS1, 60% (n=3) and 40% (n=2) of SPH therapists assigned self-made digital resources and free digital resources downloaded from the Internet (except HKEdCity) respectively. All OC therapists (n=1) assigned digital resources from the HKEdCity. In MS2, all PHY (n=1) assigned self-made digital resources for students while all SPH (n=1) and 50% of OC therapist (n=1) assigned those purchased by schools (Table 8.68b, [E8]THQ9d). Again, these figures must be interpreted with caution due to the small sample size.

Table 8.65 School heads' levels of satisfaction with enriching digital resources for learning ([E1-1/E1-2]HSQ6a-c)

	MS1								MS2								*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option: Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option: Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
a.	3.37	0.62	54	1 (2)	21 (39)	29 (54)	3 (6)	0 (0)	3.31	0.81	52	4 (8)	15 (29)	26 (50)	7 (13)	0 (0)	0.544
b.	3.50	0.64	54	2 (4)	25 (46)	25 (46)	2 (4)	0 (0)	3.58	0.70	52	3 (6)	27 (52)	19 (37)	3 (6)	0 (0)	0.483
c.	3.81	0.62	54	4 (7)	38 (70)	10 (19)	2 (4)	0 (0)	3.79	0.67	52	7 (13)	27 (52)	18 (35)	0 (0)	0 (0)	0.574

Aspects related to enriching digital resources for learning

a. The school has developed quality school-based digital resources and a repository of online resources for all key learning areas (KLAs).

b. The school has derived an effective mechanism for digital resource management to facilitate learning and teaching as well as sharing among teachers, parents and students.

c. The school from time to time acquires up-to-date digital resources for teachers'/students' use.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.66 School heads' perception of the importance of different sources of digital resources for learning and teaching ([E2-1/E2-2]HQ9a-j)

	MS1								MS2								*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option: Very important	Important	Quite important (一般)	Not important	Totally not important	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option: Very important	Important	Quite important (一般)	Not important	Totally not important	
a.	3.98	0.83	58	15 (26)	30 (52)	11 (19)	1 (2)	1 (2)	4.00	0.86	52	15 (29)	26 (50)	7 (13)	4 (8)	0 (0)	0.814
b.	3.97	0.70	58	12 (21)	33 (57)	12 (21)	1 (2)	0 (0)	3.96	0.68	52	10 (19)	31 (60)	10 (19)	1 (2)	0 (0)	0.984
c.	3.97	0.72	58	13 (22)	31 (53)	13 (22)	1 (2)	0 (0)	3.98	0.85	52	15 (29)	23 (44)	13 (25)	0 (0)	1 (2)	0.793
d.	3.95	0.63	58	10 (17)	35 (60)	13 (22)	0 (0)	0 (0)	4.04	0.56	52	9 (17)	36 (69)	7 (13)	0 (0)	0 (0)	0.427
e.	3.36	1.07	58	6 (10)	25 (43)	15 (26)	8 (14)	4 (7)	3.44	0.87	52	4 (8)	23 (44)	18 (35)	6 (12)	1 (2)	0.891
f.	2.41	0.84	58	0 (0)	5 (9)	22 (38)	23 (40)	8 (14)	2.27	0.89	52	0 (0)	4 (8)	17 (33)	20 (38)	11 (21)	0.381
g.	2.40	0.82	58	0 (0)	4 (7)	23 (40)	23 (40)	8 (14)	2.33	0.83	52	0 (0)	3 (6)	20 (38)	20 (38)	9 (17)	0.682
h.	2.76	0.90	58	1 (2)	11 (19)	23 (40)	19 (33)	4 (7)	2.85	0.96	52	1 (2)	11 (21)	25 (48)	9 (17)	6 (12)	0.478
i.	3.24	0.82	58	3 (5)	17 (29)	31 (53)	5 (9)	2 (3)	3.27	1.16	52	6 (12)	19 (37)	16 (31)	5 (10)	6 (12)	0.512
j.	3.81	0.80	58	10 (17)	31 (53)	13 (22)	4 (7)	0 (0)	3.90	0.82	52	12 (23)	26 (50)	11 (21)	3 (6)	0 (0)	0.538

Sources of digital resources for learning and teaching in school

a. Digital resources produced by teachers/therapists

b. Free digital resources downloaded from the Internet (except HKEdCity)

c. Digital resources from HKEdCity

d. Digital resources purchased by the school

e. Digital resources purchased by means of the "Electronic Learning Credit"

f. Digital resources purchased from parents' donations

g. Digital resources purchased by parents

h. Digital resources purchased from the funding of the sponsoring body

i. Digital resources purchased by/obtained via community resources (e.g. publishers and IT industries)

j. Digital resources obtained from Quality Education Fund

Mean: 1= "Totally not important" and 5="Very important; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.67a Teachers' frequency in using different digital resources ([E5]TQ10a.i-xi)

Special school types		MS1														MS2														*P*-value
		Mean (1-5)	SD	N	Count (%) of Teachers choosing the option											Mean (1-5)	SD	N	Count (%) of Teachers choosing the option											
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never						Very Frequently		Frequently		Occasionally (間中)		Rarely		Never			
NC	i.	2.57	1.18	103	9	(9)	12	(12)	27	(26)	36	(35)	19	(18)		2.76	1.18	136	16	(12)	15	(11)	44	(32)	43	(32)	18	(13)		0.191
	ii.	2.60	0.93	103	3	(3)	10	(10)	46	(45)	31	(30)	13	(13)		2.62	0.91	136	2	(1)	18	(13)	58	(43)	42	(31)	16	(12)		0.847
	iii.	3.45	0.84	103	12	(12)	33	(32)	47	(46)	11	(11)	0	(0)		3.22	0.93	136	10	(7)	41	(30)	60	(44)	19	(14)	6	(4)		0.105
	iv.	3.09	1.01	103	8	(8)	26	(25)	43	(42)	19	(18)	7	(7)		3.18	0.95	136	10	(7)	39	(29)	60	(44)	20	(15)	7	(5)		0.438
	v.	3.17	0.99	103	10	(10)	25	(24)	45	(44)	18	(17)	5	(5)		3.09	0.98	136	9	(7)	36	(26)	57	(42)	26	(19)	8	(6)		0.623
	vi.	2.96	0.83	103	3	(3)	21	(20)	51	(50)	25	(24)	3	(3)		2.91	0.90	136	3	(2)	31	(23)	62	(46)	31	(23)	9	(7)		0.817
	vii..	2.72	0.81	103	0	(0)	16	(16)	49	(48)	31	(30)	7	(7)		2.77	0.87	136	4	(3)	17	(13)	69	(51)	36	(26)	10	(7)		0.712
	viii.	2.38	0.88	103	1	(1)	8	(8)	36	(35)	42	(41)	16	(16)		2.38	0.87	136	2	(1)	7	(5)	54	(40)	51	(38)	22	(16)		0.914
	ix.	3.24	0.98	103	10	(10)	32	(31)	37	(36)	21	(20)	3	(3)		3.42	0.91	136	14	(10)	52	(38)	49	(36)	19	(14)	2	(1)		0.156
	x.	3.02	0.90	103	6	(6)	21	(20)	48	(47)	25	(24)	3	(3)		2.88	0.94	136	3	(2)	32	(24)	58	(43)	32	(24)	11	(8)		0.414
	xi.	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)		1.88	1.13	8	0	(0)	1	(13)	1	(13)	2	(25)	4	(50)		---
ID	i.	3.45	1.04	88	16	(18)	25	(28)	33	(38)	11	(13)	3	(3)		3.56	1.12	59	15	(25)	15	(25)	19	(32)	8	(14)	2	(3)		---
	ii.	3.27	0.84	88	4	(5)	31	(35)	41	(47)	9	(10)	3	(3)		3.07	0.93	59	3	(5)	15	(25)	27	(46)	11	(19)	3	(5)		---
	iii.	3.08	0.81	88	2	(2)	24	(27)	43	(49)	17	(19)	2	(2)		2.92	0.99	59	3	(5)	12	(20)	26	(44)	13	(22)	5	(8)		---
	iv.	3.19	1.03	88	9	(10)	23	(26)	38	(43)	12	(14)	6	(7)		3.08	1.10	59	7	(12)	12	(20)	24	(41)	11	(19)	5	(8)		---
	v.	3.23	1.03	88	10	(11)	23	(26)	37	(42)	13	(15)	5	(6)		3.15	1.06	59	6	(10)	15	(25)	25	(42)	8	(14)	5	(8)		---
	vi.	2.77	0.96	88	4	(5)	11	(13)	43	(49)	21	(24)	9	(10)		2.75	1.08	59	5	(8)	6	(10)	24	(41)	17	(29)	7	(12)		---
	vii..	2.63	0.96	88	4	(5)	7	(8)	40	(45)	26	(30)	11	(13)		2.49	0.97	59	2	(3)	5	(8)	22	(37)	21	(36)	9	(15)		---
	viii.	2.25	0.89	88	1	(1)	5	(6)	27	(31)	37	(42)	18	(20)		2.07	0.83	59	0	(0)	2	(3)	16	(27)	25	(42)	16	(27)		---
	ix.	2.19	0.95	88	1	(1)	3	(3)	34	(39)	24	(27)	26	(30)		2.10	1.05	59	2	(3)	2	(3)	17	(29)	17	(29)	21	(36)		---
	x.	2.24	0.86	88	1	(1)	1	(1)	36	(41)	30	(34)	20	(23)		2.05	0.80	59	0	(0)	0	(0)	20	(34)	22	(37)	17	(29)		---
	xi.	1.80	1.79	5	1	(20)	0	(0)	0	(0)	0	(0)	4	(80)		1.00	0.00	1	0	(0)	0	(0)	0	(0)	0	(0)	1	(100)		---

Digital resources

i. Resources developed by yourself
ii. Resources developed by your school
iii. Resources purchased by your school
iv. HKEdCity
v. Free resources downloaded from the Internet
vi. Resources developed by Education and Manpower Bureau
vii. Resources provided by other government department(s)/voluntary organisation(s)
viii. Tertiary institution(s)
ix. Resources provided by textbook publisher(s)
x. Resources developed by other software vendor(s)
xi. Others

Mean: 1= "Totally not important" and 5="Very important; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

Table 8.67b Therapists' frequency in using different digital resources ([E8]THQ9a.i-xi)

Therapist types		MS1															MS2														
		Mean (1-5)	SD	N	Count (%) of Therapists choosing the option												Mean (1-5)	SD	N	Count (%) of Therapists choosing the option											
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never							Very Frequently		Frequently		Occasionally (間中)		Rarely		Never			
SPH	i.	3.09	1.38	11	2	(18)	2	(18)	4	(36)	1	(9)	2	(18)			2.33	1.41	9	1	(11)	0	(0)	4	(44)	0	(0)	4	(44)		
	ii.	2.64	1.29	11	1	(9)	1	(9)	5	(45)	1	(9)	3	(27)			2.56	1.01	9	0	(0)	1	(11)	5	(56)	1	(11)	2	(22)		
	iii.	2.55	1.04	11	0	(0)	1	(9)	7	(64)	0	(0)	3	(27)			3.00	1.22	9	2	(22)	0	(0)	3	(33)	4	(44)	0	(0)		
	iv.	2.64	1.03	11	0	(0)	2	(18)	5	(45)	2	(18)	2	(18)			1.89	0.78	9	0	(0)	0	(0)	2	(22)	4	(44)	3	(33)		
	v.	2.91	1.30	11	1	(9)	3	(27)	3	(27)	2	(18)	2	(18)			2.11	0.93	9	0	(0)	0	(0)	4	(44)	2	(22)	3	(33)		
	vi.	2.36	1.21	11	0	(0)	2	(18)	4	(36)	1	(9)	4	(36)			1.78	0.67	9	0	(0)	0	(0)	1	(11)	5	(56)	3	(33)		
	vii..	2.27	1.10	11	0	(0)	1	(9)	5	(45)	1	(9)	4	(36)			2.00	0.71	9	0	(0)	0	(0)	2	(22)	5	(56)	2	(22)		
	viii.	1.73	1.10	11	0	(0)	1	(9)	2	(18)	1	(9)	7	(64)			1.78	0.67	9	0	(0)	0	(0)	1	(11)	5	(56)	3	(33)		
	ix.	1.82	1.08	11	0	(0)	1	(9)	2	(18)	2	(18)	6	(55)			1.44	0.53	9	0	(0)	0	(0)	0	(0)	4	(44)	5	(56)		
	x.	2.09	1.04	11	0	(0)	1	(9)	3	(27)	3	(27)	4	(36)			2.33	1.32	9	1	(11)	0	(0)	3	(33)	2	(22)	3	(33)		
	xi.	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)			0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)		
PHY	i.	1.33	0.82	6	0	(0)	0	(0)	1	(17)	0	(0)	5	(83)			2.57	1.27	7	0	(0)	2	(29)	2	(29)	1	(14)	2	(29)		
	ii.	1.67	0.82	6	0	(0)	0	(0)	1	(17)	2	(33)	3	(50)			2.71	1.50	7	1	(14)	1	(14)	2	(29)	1	(14)	2	(29)		
	iii.	2.33	1.51	6	1	(17)	0	(0)	1	(17)	2	(33)	2	(33)			2.57	0.98	7	0	(0)	1	(14)	3	(43)	2	(29)	1	(14)		
	iv.	1.17	0.41	6	0	(0)	0	(0)	0	(0)	1	(17)	5	(83)			1.43	0.79	7	0	(0)	0	(0)	1	(14)	1	(14)	5	(71)		
	v.	1.50	0.84	6	0	(0)	0	(0)	1	(17)	1	(17)	4	(67)			2.43	0.98	7	0	(0)	0	(0)	5	(71)	0	(0)	2	(29)		
	vi.	1.17	0.41	6	0	(0)	0	(0)	0	(0)	1	(17)	5	(83)			1.29	0.49	7	0	(0)	0	(0)	0	(0)	2	(29)	5	(71)		
	vii..	1.50	0.84	6	0	(0)	0	(0)	1	(17)	1	(17)	4	(67)			1.71	0.95	7	0	(0)	0	(0)	2	(29)	1	(14)	4	(57)		
	viii.	1.33	0.52	6	0	(0)	0	(0)	0	(0)	2	(33)	4	(67)			1.43	0.79	7	0	(0)	0	(0)	1	(14)	1	(14)	5	(71)		
	ix.	1.17	0.41	6	0	(0)	0	(0)	0	(0)	1	(17)	5	(83)			2.00	1.29	7	0	(0)	1	(14)	2	(29)	0	(0)	4	(57)		
	x.	1.50	0.84	6	0	(0)	0	(0)	1	(17)	1	(17)	4	(67)			1.43	0.79	7	0	(0)	0	(0)	1	(14)	1	(14)	5	(71)		
	xi.	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)			0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)		
OC	i.	2.29	1.11	7	0	(0)	1	(14)	2	(29)	2	(29)	2	(29)			2.36	1.12	11	0	(0)	2	(18)	3	(27)	3	(27)	3	(27)		
	ii.	1.43	0.79	7	0	(0)	0	(0)	1	(14)	1	(14)	5	(71)			2.91	0.83	11	1	(9)	0	(0)	7	(64)	3	(27)	0	(0)		
	iii.	1.86	1.07	7	0	(0)	0	(0)	3	(43)	0	(0)	4	(57)			2.82	0.75	11	0	(0)	2	(18)	5	(45)	4	(36)	0	(0)		
	iv.	1.00	0.00	7	0	(0)	0	(0)	0	(0)	0	(0)	7	(100)			2.45	1.04	11	0	(0)	1	(9)	6	(55)	1	(9)	3	(27)		
	v.	1.43	0.79	7	0	(0)	0	(0)	1	(14)	1	(14)	5	(71)			2.91	0.94	11	0	(0)	3	(27)	5	(45)	2	(18)	1	(9)		
	vi.	1.00	0.00	7	0	(0)	0	(0)	0	(0)	0	(0)	7	(100)			2.09	1.04	11	0	(0)	1	(9)	3	(27)	3	(27)	4	(36)		
	vii..	1.57	0.98	7	0	(0)	0	(0)	2	(29)	0	(0)	5	(71)			2.18	0.87	11	0	(0)	0	(0)	5	(45)	3	(27)	3	(27)		
	viii.	1.57	0.79	7	0	(0)	0	(0)	1	(14)	2	(29)	4	(57)			2.18	0.87	11	0	(0)	0	(0)	5	(45)	3	(27)	3	(27)		
	ix.	1.14	0.38	7	0	(0)	0	(0)	0	(0)	1	(14)	6	(86)			1.82	0.87	11	0	(0)	0	(0)	3	(27)	3	(27)	5	(45)		
	x.	2.00	1.00	7	0	(0)	0	(0)	3	(43)	1	(14)	3	(43)			2.36	1.03	11	0	(0)	2	(18)	2	(18)	5	(45)	2	(18)		
	xi.	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)			0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)		

Digital resources

i. Resources developed by yourself
ii. Resources developed by your school
iii. Resources purchased by your school
iv. HKEdCity
v. Free resources downloaded from the Internet
vi. Resources developed by Education and Manpower Bureau
vii. Resources provided by other government department(s)/voluntary organisation(s)
viii. Tertiary institution(s)
ix. Resources provided by textbook publisher(s)
x. Resources developed by other software vendor(s)
xi. Others

Mean: 1= "Totally not important" and 5="Very important

Table 8.68a Digital resources assigned by teachers for students to learn subject knowledge and used by students on their own initiative for self-learning beyond school hours ([E5]TQ10d, [E6-1]SQ10c, [E6-2/E6-3]SQ11c, [E6-4/E6-5/E6-6]SQ13c)

Digital Resources	Percentage (%) choosing the options									
	Digital resources which students used on their own initiative for self-learning beyond school hours					Digital resources which teachers assigned students to use for learning subject knowledge beyond school hours				
	NC Students			ID Students		NC Teachers			ID Teachers	
	MS1 (N=37)	MS2 (N=57)	*P*-value	MS1 (N=32)	MS2 (N=12)	MS1 (N=45)	MS2 (N=74)	*P*-value	MS1 (N=30)	MS2 (N=18)
Self-made digital resources by the teachers	35	35	0.923	66	50	18	12	0.398	47	83
Free digital resources downloaded from the Internet (except HKEdCity)	22	39	0.044	19	92	53	45	0.357	40	39
Digital resources purchased by the school	16	21	0.256	38	33	49	38	0.238	20	11
Digital resources from HKEdCity	27	30	0.150	41	58	40	38	0.815	40	39
Others	51	11	0.000***	16	0	16	20	0.522	30	0

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.68b Digital resources that assigned by therapists for students to proceed therapy/training beyond school hours ([E8]THQ9d)

Digital Resources	Percentage (%) Therapists choosing the options					
	Digital resources which therapists assigned students to use to conduct therapy/training beyond school hours					
	SPH		PHY		OC	
	MS1 (N=5)	MS2 (N=1)	MS1 (N=0)	MS2 (N=1)	MS1 (N=1)	MS2 (N=2)
Self-made digital resources by the therapists	60	0	0	100	0	0
Free digital resources downloaded from the Internet (except HKEdCity)	40	0	0	0	0	0
Digital resources purchased by the school	0	100	0	0	0	50
Digital resources from HKEdCity	0	0	0	0	100	0
Others	20	0	0	0	0	50

Multiple responses items

Teachers and students tended to perceive that the digital resources were helpful for students' learning

Concerning the helpfulness of digital resources for learning, no matter they were assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours, 46% to 58% of NC and 59% to 86% of ID students considered these resources to be helpful or definitely helpful in MS1 and MS2. The mean ratings fell in the range of 3.22 to 3.92 (SD:0.48-1.20) on a scale of 1 to 5 where 1 was 'definitely not' and 5 was 'yes definitely'. A statistically significant increase was noted for NC students' perceived level of helpfulness of the digital resources used on their own initiative for self-learning (from 46% to 58%) in MS2 (Table 8.69, [E6-1]SQ9d,10d, [E6-2/E6-3]SQ10d,11d, [E6-4/E6-5/E6-6] SQ11d,13d). Similarly, 64% and 53% of NC and ID teachers in MS1 respectively as well as 50% of both NC and ID teachers in MS2 considered the digital resources which they assigned to students to be helpful or definitely helpful for students' learning of the subject content, with mean ratings of 3.49-3.62 (SD:0.51-0.65) in MS1 and MS2. No statistically significant difference was observed for NC teachers in MS2. (Table 8.69, [E5]TQ10e).

As for the helpfulness of the digital resources assigned by the therapists for therapy or training, all (n=2) and 50% (n=3) of NC as well as 58% (n=7) and 79% (n=23) of ID students in MS1 and MS2 respectively found the resources to be helpful or definitely helpful. The mean ratings for NC and ID students were 3.50-4.50 (SD: 0.55-0.71) and 3.67-3.79 (SD:0.41-0.65) respectively on a scale of 1 to 5 where 1 was 'definitely not' and 5 was 'yes definitely' (Table 8.69, [E6-4/E6-5/E6-6]SQ12d). To compare with therapists' response, 40% of SPH (n=2) and all OC therapists (n=1) in MS1 considered the digital resources assigned to students to be helpful for students' therapy or training, with mean ratings of 3.40 (SD:0.55) and 4.00 (SD:0.00) respectively. All three types of therapists (n=1-2) in MS2 considered the resources as helpful or definitely helpful (Table 8.69, [E8]THQ9e).

Table 8.69 Teachers'/Therapists' and students' perception of the helpfulness of digital resources assigned by teachers/therapists for learning subject knowledge/therapy/training or used by students on their own initiative for self-learning beyond school hours ([E5]TQ10e, [E6-1]SQ9d,10d, [E6-2/E6-3] SQ10d,11d, [E6-4/E6-5/E6-6]SQ11d,12d,13d, [E8]THQ9e)

Special school types/Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Yes definitely		Yes		Maybe (一般)		No		Definitely not		
Levels of helpfulness of the digital resources assigned by teachers for learning subject knowledge beyond school hours															
NC Students	MS1	3.68	0.83	31	5	(16)	13	(42)	11	(35)	2	(6)	0	(0)	0.768
	MS2	3.57	0.95	72	11	(15)	28	(39)	27	(38)	3	(4)	3	(4)	
ID Students	MS1	3.71	0.80	34	3	(9)	21	(61)	8	(24)	1	(3)	1	(3)	---
	MS2	3.85	0.48	40	1	(3)	33	(83)	5	(13)	1	(3)	0	(0)	
NC Teachers	MS1	3.62	0.53	45	0	(0)	29	(64)	15	(33)	1	(2)	0	(0)	0.191
	MS2	3.49	0.65	74	2	(3)	35	(47)	35	(47)	1	(1)	1	(1)	
ID Teachers	MS1	3.53	0.51	30	0	(0)	16	(53)	14	(47)	0	(0)	0	(0)	---
	MS2	3.50	0.51	18	0	(0)	9	(50)	9	(50)	0	(0)	0	(0)	
Levels of helpfulness of the digital resources assigned by therapists for therapy/training beyond school hours															
NC Students	MS1	4.50	0.71	2	1	(50)	1	(50)	0	(0)	0	(0)	0	(0)	---
	MS2	3.50	0.55	6	0	(0)	3	(50)	3	(50)	0	(0)	0	(0)	
ID Students	MS1	3.67	0.65	12	1	(8)	6	(50)	5	(42)	0	(0)	0	(0)	---
	MS2	3.79	0.41	29	0	(0)	23	(79)	6	(21)	0	(0)	0	(0)	
SPH	MS1	3.40	0.55	5	0	(0)	2	(40)	3	(60)	0	(0)	0	(0)	---
	MS2	4.00	0.00	1	0	(0)	1	(100)	0	(0)	0	(0)	0	(0)	
PHY	MS1	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	--
	MS2	4.00	0.00	1	0	(0)	1	(100)	0	(0)	0	(0)	0	(0)	
OC	MS1	4.00	0.00	1	0	(0)	1	(100)	0	(0)	0	(0)	0	(0)	---
	MS2	4.50	0.71	2	1	(50)	1	(50)	0	(0)	0	(0)	0	(0)	
Levels of helpfulness of the digital resources used on students' initiative for self-learning beyond school hours															
NC Students	MS1	3.22	1.20	37	4	(11)	13	(35)	13	(35)	1	(3)	6	(16)	0.010*
	MS2	3.77	0.87	57	13	(23)	20	(35)	23	(40)	0	(0)	1	(2)	
ID Students	MS1	3.41	0.98	32	2	(6)	17	(53)	8	(24)	4	(12)	2	(6)	---
	MS2	3.92	0.67	12	2	(17)	7	(58)	3	(25)	0	(0)	0	(0)	

Mean: 1="Definitely not" and 5="Yes definitely"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to consider digital resources in schools as sufficient whereas NC teachers in both MS1 and MS2 as well as ID teachers in MS1 considered them as quite sufficient (一般) – ID teachers in MS2 considered them as sufficient

With regard to the sufficiency of digital resources (e.g. educational CDs and learning resources from the Internet) in schools, 45% and 43% of NC as well as 58% and 28% of ID students in MS1 and MS2 respectively indicated that the resources were sufficient or very sufficient. The mean ratings for NC and ID students were 3.25-3.36 (SD:0.98-1.03) and 3.25-3.55 (SD:0.63-0.86) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 8.70, [E6-1/E6-3]SQ7h, [E6-2]SQ7f, [E6-4/E6-5/E6-6]SQ8h). No statistically significant difference was noted for NC students in MS2.

From the teachers' point of view, 27% and 31% of NC as well as 39% and 63% of ID teachers in MS1 and MS2 respectively considered the digital resources as sufficient or very sufficient. The mean ratings for NC and ID were 3.00-3.16 (SD:0.73-0.80) and 3.23-3.78 (SD:0.78-1.07) respectively. No statistically significant difference was noted for NC teachers in MS2 (Table 8.70, ([E5]TQ7i). The above findings indicated that students' perception of the sufficiency of the digital resources in schools was higher than the teachers except for ID teachers in MS2.

From the therapists' point of view, 54% of SPH (n=6) and 67% of PHY therapists (n=4) in MS1 considered the digital resources as sufficient or very sufficient, with mean ratings of 3.73 (SD:0.79) and 3.50 (SD:0.84) respectively. Comparatively speaking, OC therapists found the digital resources for therapy or training to be less sufficient. In MS1, 29% of OC therapists (n=2) considered the digital resources as sufficient, with mean ratings of 3.14 (SD:0.69). In MS2, 33% (n=3), 43% (n=3) and 45% (n=5) of SPH, PHY and OC therapists respectively considered the resources as sufficient (Table 8.70, [E8]THQ6i).

Table 8.70 Students' and teachers'/therapists' perception of the sufficiency of digital resources in schools ([E5]TQ7i, [E6-1/E6-3]SQ7h, [E6-2]SQ7f, [E6-4/E6-5/E6-6]SQ8h, [E8]THQ6i)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
Levels of sufficiency of the digital resources in schools															
NC Students	MS1	3.25	1.03	80	5	(6)	31	(39)	31	(39)	5	(6)	8	(10)	0.271
	MS2	3.36	0.98	159	21	(13)	47	(30)	64	(40)	22	(14)	5	(3)	
ID Students	MS1	3.55	0.86	123	12	(9)	61	(49)	37	(30)	12	(10)	2	(2)	---
	MS2	3.25	0.63	60	2	(3)	15	(25)	39	(65)	4	(7)	0	(0)	
NC Teachers	MS1	3.00	0.80	103	1	(1)	27	(26)	49	(48)	23	(22)	3	(3)	0.151
	MS2	3.16	0.73	136	3	(2)	39	(29)	72	(53)	21	(15)	1	(1)	
ID Teachers	MS1	3.23	0.78	88	1	(1)	33	(38)	42	(48)	9	(10)	3	(3)	---
	MS2	3.78	1.07	59	18	(31)	19	(32)	14	(24)	7	(12)	1	(2)	
SPH	MS1	3.73	0.79	11	2	(18)	4	(36)	5	(45)	0	(0)	0	(0)	---
	MS2	3.33	0.50	9	0	(0)	3	(33)	6	(67)	0	(0)	0	(0)	
PHY	MS1	3.50	0.84	6	0	(0)	4	(67)	1	(17)	1	(17)	0	(0)	---
	MS2	3.43	0.53	7	0	(0)	3	(43)	4	(57)	0	(0)	0	(0)	
OC	MS1	3.14	0.69	7	0	(0)	2	(29)	4	(57)	1	(14)	0	(0)	---
	MS2	3.36	0.67	11	0	(0)	5	(45)	5	(45)	1	(9)	0	(0)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Special schools were quite in need of increasing or upgrading digital resources as perceived by ITEd Team teachers

78% and 80% of the ITEd Team teachers in MS1 and MS2 respectively indicated that their schools were quite in need or much in need of increasing or upgrading digital resources, which was the second greatest support needed by special schools (Table 8.71, [E4-1/E4-2]ITQ5d).

Table 8.71 ITEd Team teachers' perception of the needs of different types of support for teachers and students in school ([E4-1/E4-2]ITQ5d)

	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option										*P*-value
				Much in need		Quite in need		Average		Not much in need		No need at all		
"To increase/upgrade digital resources"														
MS1	4.03	0.70	40	10	(25)	21	(53)	9	(23)	0	(0)	0	(0)	0.569
MS2	4.10	0.79	31	10	(32)	15	(48)	5	(16)	1	(3)	0	(0)	

Mean: 1= "No need at all" and 5="Much in need"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Lack of suitable digital resources was one of the major problems that schools encountered when implementing school ITEd plans as perceived by school heads

In MS1, school heads indicated that the lack of suitable educational software or digital resources (45%) was the major problem that schools often or most often encountered when implementing school ITEd plans (Table 8.72, [E2-1/E2-2]HQ3n). From ITEd team teachers' point of view, one of the top two difficulties that they frequently or very frequently encountered was insufficient IT facilities and digital resources from the EMB (MS1: 41%, MS2: 45%) (Table 8.72, [E4-1/4-2]ITQ4k). No statistically significant difference was identified in school heads' perceived frequency of the difficulties encountered in implementing of ITEd plans in MS2.

Table 8.72 School heads' and ITEd Team teachers' perceived frequency of difficulties encountered in implementing of ITEd plan ([E2-1/E2-2]HQ3n, [E4-1/4-2] ITQ4k)

Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Most often		Often		Occasionally (間中)		Rarely		Never		
"Lacking in suitable educational software/digital resources" (Mean: 1="Never" and 5="Most often")															
School heads	MS1	3.45	1.05	58	12	(21)	14	(24)	20	(34)	12	(21)	0	(0)	0.822
	MS2	3.38	0.99	52	8	(15)	14	(27)	21	(40)	8	(15)	1	(2)	
		Mean (1-5)	**SD**	**N**	**Count (%) choosing the option**										***P*-value**
					Very Frequently		**Frequently**		**Occasionally (間中)**		**Rarely**		**Never**		
"There are insufficient IT facilities and digital resources from Education and Manpower Bureau" (Mean: 1="Never" and 5="Very frequently")															
ITEd team teachers	MS1	3.30	0.88	40	3	(8)	13	(33)	18	(45)	5	(13)	1	(3)	---
	MS2	3.19	1.01	31	2	(6)	12	(39)	8	(26)	8	(26)	1	(3)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.4.2 Digital Resources Repository

Schools have to keep a wide variety of high quality digital resources which should be well gathered and managed for easy sharing, retrieval and utilization. This section examines two digital resources repository platforms: school e-learning platforms and the HKEdCity, in terms of the learning effectiveness and satisfaction level of the services provided.

8.4.2.1 School e-Learning Platforms

e-Learning platform is a learning system developed within the environment of the Internet or intranet which provides various learning tools such as learning material download, assignment submission, online tests, learning records etc.

17% and 43% of NC and ID teachers respectively as well as 58% and 38% of NC and ID students respectively used e-learning platforms for teaching or learning in MS1 – a statistically significant decrease was noted in the percentage of NC students having used school e-learning platforms while an increase was observed in their frequency of the usage in MS2

With regard to the usage of e-learning platforms, 17% and 23% of NC as well as 43% and 31% of ID teachers in MS1 and MS2 respectively used them for teaching (Table 8.73a, [E5]TQ11a). 58% and 41% of NC as well as 38% and 27% of ID students in MS1 and MS2 respectively indicated that they used the platforms for learning (Table 8.73a, [E6-1]SQ11a, [E6-2/E6-3]SQ12a, [E6-4/E6-5/E6-6]SQ14a). 55% (n=6) and 11% (n=1) of SPH therapists in MS1 and MS2 respectively used the platforms for therapy or training. None of PHY and OC therapists used the platforms for this purpose in MS1 while 29% and 20% of PHY (n=2) and OC (n=2) therapists used the platforms for this purpose in MS2 (Table 8.73b, [E8]THQ10a). A statistically significant decrease was noted in the percentage of NC students using e-learning platforms for learning (from 58% to 41%) in MS2.

In terms of the frequency of usage, 58% and 73% of NC students as well as 58% and 63% ID students in MS1 and MS2 respectively visited school e-learning platforms 1 to 10 times during the week prior to the conduct of the questionnaire survey. 6% and 19% of NC as well as 36% and 6% of ID students in MS1 and MS2 respectively reported using the platforms 11 times or more (Table 8.73a, [E6-1]SQ11b, [E6-2/E6-3]SQ12b, [E6-4/E6-5/E6-6]SQ14b). A statistically significant increase was observed in the frequency of usage by NC students (from 58% to 73% had used 1 to 10 times and from 6% to 19% had used 11 times or more) in MS2. As for teachers, 65% and 81% of NC and ID teachers respectively used the e-learning platforms to conduct teaching 1 to 10 times while 12% and 6% respectively used the platforms 11 times or more during the week prior to the conduct of the questionnaire survey in MS1. No statistically significant difference was noted in teachers' usage in MS2. 73% of ID teachers used the platforms 1 to 10 times while 12% of them used the platforms 11 times or more in MS2 (Table 8.73a, [E5]TQ11b). As for therapists, 83% (n=5) and all (n=1) of SPH in MS1 and MS2 respectively used the platforms to proceed therapy/training 1 to 4 times. All PHY therapists (n=2) in MS2 used the platforms 5 to 15 times. 50% of OC (n=1) used the platforms 16 times or more while 50% of them (n=1) used 1 to 4 times in MS2 (Table 8.73b, [E8]THQ10a,b).

Table 8.73a The usage of e-learning platforms to conduct teaching / learning by teachers and students during the week prior to the conduct of the questionnaire survey ([E5]TQ11a,b, [E6-1]SQ11a,b, [E6-2/E6-3]SQ12a,b, [E6-4/E6-5/E6-6]SQ14a,b)

	Percentage (%) choosing the option											
	NC Students		*P*-value		ID Students		NC Teachers		*P*-value		ID Teachers	
	MS1 (N=77)	MS2 (N=153)			MS1 (N=127)	MS2 (N=60)	MS1 (N=100)	MS2 (N=129)			MS1 (N=87)	MS2 (N=58)
Yes	58	41	0.002** [a]		38	27	17	23	0.246 [a]		43	31
No	42	59			62	73	83	77			57	69
Frequency	**(N=45)**	**(N=62)**	$\chi^2_{(df=4)}$	***P*-value**	**(N=48)**	**(N=16)**	**(N=17)**	**(N=30)**	$\chi^2_{(df=4)}$	***P*-value**	**(N=37)**	**(N=18)**
16 times or above	4	13			26	6	6	0			3	6
11 to 15 times	2	6			10	0	6	0			3	6
5 to 10 times	20	15	20.45	0.000*** [b]	15	0	12	20	4.14	0.387 [b d] [0.538] [a]	22	17
1 to 4 times	38	58			43	63	53	50			59	56
Nil	36	8			6	31	24	30			14	17

[a.]Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.]Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.; [d.] Chi-square Test: Over 20% of cells have expected count less than 5.

Table 8.73b The usage of e-learning platforms to proceed therapy/training by therapists during the week prior to the conduct of the questionnaire survey ([E8]THQ10a,b)

	Percentage (%) Therapists choosing the option					
	SPH		PHY		OC	
	MS1 (N=11)	MS2 (N=9)	MS1 (N=6)	MS2 (N=7)	MS1 (N=7)	MS2 (N=10)
Yes	55	11	0	29	0	20
No	45	89	100	71	100	80
Frequency	**(N=6)**	**(N=1)**	**(N=0)**	**(N=2)**	**(N=0)**	**(N=2)**
16 times or above	0	0	0	0	0	50
11 to 15 times	0	0	0	50	0	0
5 to 10 times	0	0	0	50	0	0
1 to 4 times	83	100	0	0	0	50
Nil	17	0	0	0	0	0

Students and teachers generally agreed that e-learning platforms could help students' learning

Regarding the learning effectiveness of e-learning platforms, 45% and 49% of NC as well as 59% and 31% of ID students in MS1 and MS2 respectively agreed or strongly agreed that e-learning platforms could help their learning. The mean ratings for NC and ID students were 3.20-3.60 (SD:0.86-1.12) and 2.69-3.66 (SD:0.82-1.25) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 8.74, [E6-1]SQ11d, [E6-2/E6-3]SQ12d, [E6-4/E6-5/E6-6]SQ14d). Teachers perceived a slightly lower level of agreement on the learning effectiveness of e-learning platforms than the students. 27% and 22% of NC as well as 34% and 25% of ID teachers in MS1 and MS2 respectively agreed that the use of e-learning platforms could help students in their learning. The mean ratings for NC and ID teachers were 3.01 (SD:0.70-0.80) and 2.98-3.15 (SD:0.79-0.81) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 8.74, [E5]TQ11d). No statistically significant difference was noted for NC teachers and students in MS2.

As for the helpfulness of students' therapy or training, only 9% of SPH (n=1) and 14% of OC therapists (n=1) in MS1 agreed that the use of e-learning platforms could help students in therapy or training, with mean ratings of 2.55 (SD:1.04) and 2.00 (SD:1.15) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. 83% of PHY therapists (n=5) in MS1 disagreed or strongly disagreed that e-learning platforms could help students in therapy or training, with a mean rating of 1.67 (SD:0.82). In MS2, 11% (n=1), 29% (n=2) and 36% (n=4) of SPH, PHY and OC therapists respectively agreed to this statement (Table 8.74, [E8]THQ10d).

Table 8.74 Teachers'/Therapists' and students' levels of agreement on the helpfulness of e-learning platforms to students' learning/therapy/training ([E5]TQ11d, [E6-1]SQ11d, [E6-2/E6-3]SQ12d, [E6-4/E6-5/E6-6]SQ14d, [E8]THQ10d)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option					*P*-value
					Strongly agree	Agree	Average	Disagree	Strongly disagree	
NC Students	MS1	3.20	1.12	45	4 (9)	16 (36)	15 (33)	5 (11)	5 (11)	0.064
	MS2	3.60	0.86	62	11 (18)	19 (31)	28 (45)	4 (6)	0 (0)	
ID Students	MS1	3.66	0.82	48	7 (14)	22 (45)	16 (33)	4 (8)	0 (0)	---
	MS2	2.69	1.25	16	0 (0)	5 (31)	6 (38)	0 (0)	5 (31)	
NC Teachers	MS1	3.01	0.80	100	0 (0)	27 (27)	52 (52)	16 (16)	5 (5)	0.697
	MS2	3.01	0.70	130	1 (1)	27 (21)	76 (58)	24 (18)	2 (2)	
ID Teachers	MS1	3.15	0.79	87	0 (0)	30 (34)	44 (51)	9 (10)	4 (5)	---
	MS2	2.98	0.81	57	0 (0)	14 (25)	32 (56)	7 (12)	4 (7)	
SPH	MS1	2.55	1.04	11	0 (0)	1 (9)	7 (64)	0 (0)	3 (27)	---
	MS2	2.67	0.71	9	0 (0)	1 (11)	4 (44)	4 (44)	0 (0)	
PHY	MS1	1.67	0.82	6	0 (0)	0 (0)	1 (17)	2 (33)	3 (50)	---
	MS2	2.57	1.27	7	0 (0)	2 (29)	2 (29)	1 (14)	2 (29)	
OC	MS1	2.00	1.15	7	0 (0)	1 (14)	1 (14)	2 (29)	3 (43)	---
	MS2	3.18	0.75	11	0 (0)	4 (36)	5 (45)	2 (18)	0 (0)	

Mean: 1="Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to be satisfied with the services provided by school e-learning platforms

Students were asked to comment on the speed of downloading or uploading information and the degree of convenience in searching learning content (Table 8.75, [E6-1]SQ11e, [E6-2/E6-3]SQ12e, [E6-4/E6-5/E6-6]SQ14e). 47% and 53% of NC as well as 54% and 31% of ID students in MS1 and MS2 respectively were satisfied or very satisfied with the services provided by the e-learning platforms. The mean ratings for NC and ID students were 3.27-3.63 (SD:0.89-1.18) and 2.94-3.67 (SD:0.74-1.06) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was noted for NC students in MS2.

Table 8.75 Students' levels of satisfaction with the services provided by school e-learning platforms ([E6-1]SQ11e, [E6-2/E6-3]SQ12e, [E6-4/E6-5/E6-6] SQ14e)

Special school types		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the services provided by the e-learning platform															
NC	MS1	3.27	1.18	45	5	(11)	16	(36)	17	(38)	0	(0)	7	(16)	0.131
	MS2	3.63	0.89	62	11	(18)	22	(35)	25	(40)	3	(5)	1	(2)	
ID	MS1	3.67	0.74	48	7	(14)	20	(40)	21	(44)	1	(2)	0	(0)	---
	MS2	2.94	1.06	16	0	(0)	5	(31)	8	(50)	0	(0)	3	(19)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

NC students and both NC and ID teachers perceived themselves as quite proficient (基本) in using e-learning platforms — a statistically significant increase was noted in NC students' self-evaluated level of proficiency in using e-learning platforms in MS2

With respect to the proficiency of teachers and students in using e-learning platforms, it was notable that only 18% and 19% of NC in MS1 and MS2 respectively as well as 32% of ID teachers in both MS1 and MS2 rated themselves as proficient or highly proficient in using e-learning platforms. The mean ratings for NC and ID teachers were 2.68-2.80 (SD:0.88-0.92) and 2.96-3.00 (SD:0.93-0.95) respectively on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient' (Table 8.76, [E5]TQ11c). Only 18% of SPH therapists (n=2) in MS1 and none of them in MS2 rated themselves as proficient in using e-learning platforms. 45% (n=5) and 66% (n=6) of SPH, 67% (n=4) and 43% (n=3) of PHY as well as 85% (n=6) and 45% (n=5) of OC therapists in MS1 and MS2 respectively rated not proficient or know nothing about using these resources at all. The mean ratings for SPH, PHY and OC therapists were 2.00-2.45 (SD:0.87-1.13), 1.67-2.43 (SD:1.03-1.13) and 1.43-2.64 (SD:0.67-0.79) respectively on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient'(Table 8.76, [E8]THQ10c). A slightly higher proficiency in this aspect was reported by NC students. 31% and 42% of NC as well as 28% and 19% of ID students in MS1 and MS2 respectively claimed that they were proficient or highly proficient in using the platforms. The mean ratings for NC and ID students were 2.84-3.37 (SD:1.12-1.30) and 2.31-2.57 (SD:1.35-1.41) respectively on a scale of 1 to 5 where 1 was 'know nothing at all' and 5 was 'highly proficient' (Table 8.76, [E6-1]SQ11c, [E6-2/E6-3]SQ12c, [E6-4/E6-5/E6-6]SQ14c). A statistically significant increase was noted in NC students' self-evaluated level of proficiency in using e-learning platforms (from 31% to 42% rated themselves as proficient or highly proficient) in MS2.

Table 8.76 Teachers'/Therapists' and students' self-evaluated proficiency in using e-learning platforms ([E5]TQ11c, [E6-1]SQ11c, [E6-2/E6-3]SQ12c, [E6-4/E6-5/E6-6]SQ14c, [E8]THQ10c)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Highly proficient		Proficient		Quite proficient (基本)		Not proficient		Know nothing at all		
Levels of proficiency in using e-learning platforms															
NC Students	MS1	2.84	1.30	45	5	(11)	9	(20)	15	(33)	6	(13)	10	(22)	0.046*
	MS2	3.37	1.12	62	13	(21)	13	(21)	22	(35)	12	(19)	2	(3)	
ID Students	MS1	2.57	1.41	47	7	(15)	6	(13)	8	(16)	13	(28)	13	(28)	---
	MS2	2.31	1.35	16	1	(6)	2	(13)	5	(31)	1	(6)	7	(44)	
NC Teachers	MS1	2.80	0.88	100	1	(1)	17	(17)	53	(53)	19	(19)	10	(10)	0.270
	MS2	2.68	0.92	131	1	(1)	23	(18)	55	(42)	37	(28)	15	(11)	
ID Teachers	MS1	3.00	0.95	87	2	(2)	26	(30)	36	(41)	16	(18)	7	(8)	---
	MS2	2.96	0.93	57	0	(0)	18	(32)	24	(42)	10	(18)	5	(9)	
SPH	MS1	2.45	1.13	11	0	(0)	2	(18)	4	(36)	2	(18)	3	(27)	---
	MS2	2.00	0.87	9	0	(0)	0	(0)	3	(33)	3	(33)	3	(33)	
PHY	MS1	1.67	1.03	6	0	(0)	0	(0)	2	(33)	0	(0)	4	(67)	---
	MS2	2.43	1.13	7	0	(0)	1	(14)	3	(43)	1	(14)	2	(29)	
OC	MS1	1.43	0.79	7	0	(0)	0	(0)	1	(14)	1	(14)	5	(71)	---
	MS2	2.64	0.67	11	0	(0)	1	(9)	5	(45)	5	(45)	0	(0)	

Mean: 1="Know nothing at all" and 5="Highly proficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.4.2.2 Educational e-Portal: Hong Kong Education City (HKEdCity)

Hong Kong Education City (www.hkedcity.net) is strongly promoted by the EMB as one of the online digital resources repository to support learning and teaching. It serves to provide quality digital resources for teachers, students, schools and the community.

33%-39% of the students and 69%-74% of the teachers visited the HKEdCity in MS1 — A statistically significant increase was noted in the percentages of NC teachers and NC students having visited this website in MS2

With regard to the frequency of visiting the HKEdCity, 33% and 54% of NC as well as 39% and 62% of ID students in MS1 and MS2 respectively reported to have visited it (Table 8.77a, [E6-1]SQ12a, [E6-2/E6-3]SQ13a, [E6-4/E6-5/E6-6]SQ15a). Among them, 54% and 67% of NC as well as 60% and 95% of ID respondents in MS1 and MS2 respectively visited it 1 to 10 times a week during the week prior to the conduct of the questionnaire survey. 8% and 18% of NC as well as 29% and 5% of ID students in MS1 and MS2 respectively reported using it 11 times a week or more (Table 8.77a, [E6-1]SQ12b, [E6-2/E6-3]SQ13b, [E6-4/E6-5/E6-6]SQ15b). A statistically significant increase was noted in the percentage of NC students (from 33% to 54%) having visited the HKEdCity in MS2.

The usage by teachers, on the other hand, was reported to be relatively higher. 69% and 82% of NC as well as 74% and 71% of ID teachers in MS1 and MS2 respectively reported that they made use of this website to assist their teaching ([E5]TQ13a). Among them, 71% and 76% of NC as well as 91% and 81% of ID teachers in MS1 and MS2 respectively used it 1 to 10 times a week during the week prior to the conduct of the questionnaire survey. 3% and 5% of NC in MS1 and MS2 respectively as well as 2% of ID teachers in both MS1 and MS2 used it 11 times or more (Table 8.77, [E5]TQ13b). A statistically significant increase was noted in the percentage of NC teachers (from 69% to 82%) having visited the HKEdCity in MS2.

As for the therapists, only 18% of SPH (n=2) and 17% of PHY therapists (n=1) in MS1 reported to have used the HKEdCity to conduct therapy or training while none of SPH, 29% of PHY (n=2) and 18% (n=2) in MS2 used this website for this purpose in MS2 (Table 8.77b, [E8]THQ12a). Amongst them, all SPH therapists (n=2) in MS1 and all OC therapists (n=2) in MS2 used it 1 to 4 times during the week prior to the conduct of the questionnaire survey (Table 8.77b [E8]THQ12b).

Table 8.77a The usage of the HKEdCity by teachers and students during the week prior to the conduct of the questionnaire survey ([E5]TQ13a,b, [E6-1]SQ12a,b [E6-2/E6-3]SQ13a,b [E6-4/E6-5/E6-6]SQ15a,b)

	Percentage (%) choosing the option									
	NC Students		*P*-value	ID Students		NC Teachers		*P*-value	ID Teachers	
	MS1 (N=78)	MS2 (N=155)		MS1 (N=126)	MS2 (N=60)	MS1 (N=103)	MS2 (N=136)		MS1 (N=88)	MS2 (N=59)
Yes	33	54		39	62	69	82		74	71
No	67	46	0.000*** [a]	61	38	31	18	0.015* [a]	26	29
Frequency	**(N=26)**	**(N=84)**	$\chi^2_{(df=4)}$ ***P*-value**	**(N=49)**	**(N=37)**	**(N=71)**	**(N=112)**	$\chi^2_{(df=4)}$ ***P*-value**	**(N=65)**	**(N=42)**
16 times or above	8	12		23	5	3	3		0	0
11 to 15 times	0	6		6	0	0	2		2	2
5 to 10 times	12	18	87.29 0.131 [b]	10	0	17	17	2.48 0.649 [b d] [0.360 [a]]	25	24
1 to 4 times	42	49		50	95	54	59		66	57
Nil	38	15		12	0	27	20		8	17

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001;[d.] Chi-square Test: Over 20% of cells have expected count less than 5.

Table 8.77b The usage of the HKEdCity by therapists during the week prior to the conduct of the questionnaire ([E8]THQ12a,b)

	Percentage (%) Therapists choosing the option					
	SPH		PHY		OC	
	MS1 (N=11)	MS2 (N=9)	MS1 (N=6)	MS2 (N=7)	MS1 (N=7)	MS2 (N=11)
Yes	18	0	17	29	0	18
No	82	100	83	71	100	82
Frequency	**(N=2)**	**(N=0)**	**(N=1)**	**(N=2)**	**(N=0)**	**(N=2)**
16 times or above	0	0	0	0	0	0
11 to 15 times	0	0	0	0	0	0
5 to 10 times	0	0	0	0	0	0
1 to 4 times	100	0	0	0	0	100
Nil	0	0	100	100	0	0

ID students perceived a higher level of satisfaction than NC students with the services provided by the HKEdCity

When examining their opinions about the services provided by the HKEdCity, 50% and 47% of NC as well as 68% and 76% of ID students in MS1 and MS2 respectively were satisfied or very satisfied with the speed of downloading or uploading information and the degree of convenience in searching learning content provided by this website. The mean ratings for NC and ID students were 3.38-3.46 (SD:0.88-0.98) and 3.76-3.78 (SD:0.48-0.95) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 8.78, [E6-1]SQ12e, [E6-2/E6-3]SQ13e, [E6-4/E6-5/E6-6]SQ15e). No statistically significant difference was noted for NC students in MS2.

Table 8.78 Students' levels of satisfaction with the services provided by the HKEdCity ([E6-1]SQ12e, [E6-2/E6-3]SQ13e, [E6-4/E6-5/E6-6]SQ15e)

Special school types		Mean (1-5)	SD	N	Count (%) Students choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the services provided at the HKEdCity (Mean: 1="Totally not satisfied" and 5="Very satisfied")															
NC	MS1	3.38	0.98	26	2	(8)	11	(42)	10	(38)	1	(4)	2	(8)	0.947
	MS2	3.46	0.88	84	10	(12)	29	(35)	37	(44)	6	(7)	2	(2)	
ID	MS1	3.76	0.95	49	9	(19)	24	(49)	12	(24)	2	(4)	2	(4)	---
	MS2	3.78	0.48	37	1	(3)	27	(73)	9	(24)	0	(0)	0	(0)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

NC students perceived that learning contents of the HKEdCity were occasionally updated

23% and 36% of NC as well as 48% and 19% of ID students in MS1 and MS2 respectively considered that the learning contents of the HKEdCity were frequently or very frequently updated. The mean ratings for NC and ID students were 3.08-3.23 (SD:0.97-1.09) and 2.92-3.57 (SD:0.95-1.15) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 8.79, [E6-1]SQ12f, [E6-2/E6-3]SQ13f, [E6-4/E6-5/E6-6]SQ15f.). No statistically significant difference was noted for NC students in MS2.

Table 8.79 Students' perceived frequency for updating the learning content at the HKEdCity ([E6-1]SQ12f, [E6-2/E6-3]SQ13f, [E6-4/E6-5/E6-6]SQ15f)

Special school types		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never		
Frequency for updating the learning content at the HKEdCity (Mean: 1="Never" and 5="Very frequently")															
NC	MS1	3.08	1.09	26	4	(15)	2	(8)	14	(54)	4	(15)	2	(8)	0.184
	MS2	3.23	0.97	84	9	(11)	21	(25)	37	(44)	14	(17)	3	(4)	
ID	MS1	3.57	1.15	49	13	(27)	10	(21)	21	(43)	1	(2)	4	(8)	---
	MS2	2.92	0.95	37	2	(5)	5	(14)	22	(59)	4	(11)	4	(11)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers and students tended to perceive that the learning materials provided by the HKEdCity were suitable for students, except ID students in MS1 who perceived a higher level of suitability in this aspect

When asked about the suitability of the learning materials provided by the HKEdCity, 51% and 41% of NC as well as 49% and 45% of ID teachers in MS1 and MS2 respectively considered the learning materials provided by this website as suitable or very suitable for their students. The mean ratings for NC and ID teachers were 3.32-3.48 (SD:0.67) and 3.29-3.48 (SD:0.73-0.89) respectively on a scale of 1 to 5 where 1 was 'totally not suitable' and 5 was 'very suitable' (Table 8.80, [E5]TQ13c). 54% and 41% of NC as well as 71% and 27% of ID students in MS1 and MS2 respectively found the materials as suitable or very suitable for their learning. The mean ratings for NC and ID students were 3.42-3.69 (SD:0.84-0.97) and 3.32-3.92 (SD:0.58-0.95) respectively (Table 8.80, [E6-1]SQ12c,

[E6-2/E6-3]SQ13c, [E6-4/E6-5/E6-6]SQ15c). No statistically significant difference was noted for NC teachers and students in MS2.

As for therapists, 50% of SPH therapists (n=1) in MS1 found the therapy or training materials provided by this website as suitable for their students, with a mean rating of 3.50 (SD:0.71). All PHY therapists in MS1 (n=1) and MS2 (n=2) as well as all OC therapists (n=2) in MS2 found this website as quite suitable (一般) for students (Table 8.80, [E8]THQ12c).

Table 8.80 Teachers'/Therapists and students' perceived levels of suitability of the learning materials provided by the HKEdCity for students ([E5]TQ13c, [E6-1]SQ12c, [E6-2/E6-3]SQ13c, [E6-4/E6-5/E6-6]SQ15c, [E8]THQ12c)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very suitable		Suitable		Quite suitable (一般)		Not suitable		Totally not suitable		
Levels of suitability of the learning materials provided by the HKEdCity for students (Mean: 1="Totally not suitable" and 5="Very suitable")															
NC Students	MS1	3.69	0.97	26	6	(23)	8	(31)	11	(42)	0	(0)	1	(4)	0.386
	MS2	3.42	0.84	84	9	(11)	25	(30)	44	(52)	4	(5)	2	(2)	
ID Students	MS1	3.92	0.95	49	15	(31)	19	(40)	10	(20)	5	(9)	0	(0)	---
	MS2	3.32	0.58	37	2	(5)	8	(22)	27	(73)	0	(0)	0	(0)	
NC Teachers	MS1	3.48	0.67	71	2	(3)	34	(48)	32	(45)	2	(3)	1	(1)	0.123
	MS2	3.32	0.67	112	1	(1)	45	(40)	56	(50)	9	(8)	1	(1)	
ID Teachers	MS1	3.48	0.73	65	4	(6)	28	(43)	28	(43)	5	(8)	0	(0)	---
	MS2	3.29	0.89	42	2	(5)	17	(40)	15	(36)	7	(17)	1	(2)	
SPH	MS1	3.50	0.71	2	0	(0)	1	(50)	1	(50)	0	(0)	0	(0)	--
	MS2	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	
PHY	MS1	3.00	0.00	1	0	(0)	0	(0)	1	(100)	0	(0)	0	(0)	---
	MS2	3.00	0.00	2	0	(0)	0	(0)	2	(100)	0	(0)	0	(0)	
OC	MS1	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	--
	MS2	3.00	0.00	2	0	(0)	0	(0)	2	(100)	0	(0)	0	(0)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

Teachers, students and ID parents tended to perceive the HKEdCity to be effective in assisting students' learning while NC parents perceived this website to be quite effective (一般)

In terms of the learning effectiveness of the HKEdCity, 55% and 45% of NC and ID teachers, 53% and 65% of NC and ID students as well as 30% and 44% of NC and ID parents respectively in MS1 considered the HKEdCity to be effective or very effective in assisting their students' learning. The mean ratings for teachers, students and parents of NC and ID respectively were 3.54 (SD:0.65) and 3.42 (SD:0.70), 3.46 (SD:1.14) and 3.69 (SD:0.98) as well as 3.20 (SD:0.63) and 3.29 (SD:0.80) on a scale of 1 to 5 where 1 was 'totally not effective' and 5 was 'very effective'. In MS2, 43% and 41% of NC and ID teachers, 44% and 27% of NC and ID students as well as 24% and 21% of NC and ID parents respectively considered this website to be effective or very effective (Table 8.81, [E5]TQ13d, [E6-1]SQ12d, [E6-2/E6-3]SQ13d, [E6-4/E6-5/E6-6]SQ15d, [E7-1/E7-2]PQ10c). No statistically significant difference was noted for NC teachers and students in MS2.

Table 8.81 Teachers', students' and parents' perception of the effectiveness of the HKEdCity in assisting students' learning ([E5]TQ13d, [E6-1]SQ12d, [E6-2/E6-3]SQ13d, [E6-4/E6-5/E6-6]SQ15d, [E7-1/E7-2]PQ10c)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option					P-value
					Very effective	Effective	Quite effective (一般)	Not effective	Totally not effective	
Levels of effectiveness of the HKEdCity in assisting students' learning (Mean: 1="Totally not effective" and 5="Very effective")										
NC Students	MS1	3.46	1.14	26	4 (15)	10 (38)	9 (35)	0 (0)	3 (12)	0.700
	MS2	3.46	0.86	84	10 (12)	27 (32)	41 (49)	4 (5)	2 (2)	
ID Students	MS1	3.69	0.98	49	9 (19)	22 (46)	10 (22)	6 (12)	1 (2)	---
	MS2	3.32	0.58	37	2 (5)	8 (22)	27 (73)	0 (0)	0 (0)	
NC Parents	MS1	3.20	0.63	10	0 (0)	3 (30)	6 (60)	1 (10)	0 (0)	---
	MS2	3.08	0.64	37	0 (0)	9 (24)	22 (59)	6 (16)	0 (0)	
ID Parents	MS1	3.29	0.80	34	1 (3)	14 (41)	13 (38)	6 (18)	0 (0)	---
	MS2	3.08	0.58	39	0 (0)	8 (21)	26 (67)	5 (13)	0 (0)	
NC Teachers	MS1	3.54	0.65	71	2 (3)	37 (52)	30 (42)	1 (1)	1 (1)	0.079
	MS2	3.37	0.67	112	2 (2)	46 (41)	56 (50)	7 (6)	1 (1)	
ID Teachers	MS1	3.42	0.70	65	3 (5)	26 (40)	31 (48)	5 (8)	0 (0)	---
	MS2	3.31	0.81	42	2 (5)	15 (36)	20 (48)	4 (10)	1 (2)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001

8.5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

The fifth strategic goal of the Second ITEd Strategy is "Improving IT infrastructure and pioneering pedagogy using IT". The progress of IT infrastructure improvement is tracked in terms of the sufficiency of serviceable IT facilities and technical support for students and teachers, especially with the new technology to support innovative pedagogy to enhance learning and teaching.

The following sections examine the extent of IT infrastructure developed in surveyed special schools in three aspects:

- Access and connectivity in schools
- Management and maintenance of IT facilities and technical support services
- Upgrading IT facilities and exploring advanced IT technology

8.5.1 Access and Connectivity in Schools

School heads were satisfied that their schools provided sound and sufficient IT facilities for students and teachers/therapists

Schools should be able to provide students and teachers with good serviceable computers and other IT facilities, well-maintained school network for communication and access to multimedia-rich content inside schools as well as sufficient bandwidth for the connection to the Internet at all times. 79% of school heads were satisfied or very satisfied that their schools provided sound and sufficient IT facilities for students and teachers/therapists in MS1. No statistically difference was identified in school heads' level of satisfaction in MS2 (Table 8.82, [E1-1/E1-2]HSQ6d).

Table 8.82 School heads' levels of satisfaction with the provision of IT infrastructure ([E1-1/ E1-2]HSQ6d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school provides sound and sufficient IT facilities for students and teachers/therapists."									
MS1	3.83	0.67	54	5 (9)	38 (70)	8 (15)	3 (6)	0 (0)	0.839
MS2	3.90	0.66	52	9 (17)	29 (56)	14 (27)	0 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.5.1.1 Quantities and Locations of Hardware

Hardware was improved in special schools – the percentage of schools having Wireless LAN significantly increased statistically

With extensive input and support from the EMB under the Five-year Strategy, fundamental IT infrastructure has been well set up in schools. Table 8.83 ([E3]ITEdInfoQ3a.i-ii) lists out the average number of different types of hardware in special schools. In MS1, the numbers of desktop and notebook computers per school were 68.28 and 11.56 respectively. The average number of video broadcasting systems was 0.09. A statistically significant increase was noted in the percentage of school having at least 1 wireless LAN in schools from 43% in MS1 to 75% in MS2 ([E3]ITEdInfoQ3aii_1). The numbers of digital projectors for mobile use and that for fixed installation were 2.81 and 10.03 respectively in MS1. The average number of digital projectors for mobile use was 2.81 per school in MS1 ([E3]ITEdInfoQ3aii_6,4_3). Regarding the provision of

electronic whiteboards, there was an average of 0.17 electronic whiteboards for mobile use and 0.22 for fixed installation per special school in MS1. No statistically significant difference was noted in MS2 ([E3]ITEdInfoQ3aii_4, 4_4).

As mentioned in the Overall Study, the IT facilities in different locations, especially in classroom, provided the convenience of IT integration for learning and teaching. This survey has enquired about the locations of IT facilities, including computers, digital projectors and electronic whiteboards. As seen from Table 8.83 ([E3]ITEdInfoQ4a-g), as reported in MS1, an average of 14.00 computers (including desktop and notebook) per special school were allocated to an average of 11.19 general classrooms. Schools reported an average of 21.30 computers in computer rooms [including Multimedia Learning Centre (MMLC) or IT Learning Centre (ITLC) and Computer Laboratory (CL)] per school. Regarding digital projectors, schools indicated that there was an average of 5.65 digital projectors (including LCD projectors) installed in 11.19 general classrooms in MS1. No statistically significant difference was noted in MS2.

Table 8.83 Quantity of IT facilities and services in school ([E3]ITEdInfoQ3a.i-ii, 4a-g)

IT facilities	MS1		MS2		*P*-value
	Mean	SD	Mean	SD	
i. Computers:					
Desktop Computer	68.28	37.20	68.02	33.12	0.454
Notebook	11.56	12.79	12.87	13.35	0.312
Sum of Computers (Desktop Computer and Notebook)	79.83	42.48	80.89	39.96	0.471
Computers (including desktop and notebook) located in general classrooms	14.00	14.79	13.91	13.21	0.836
Number of general classrooms	11.19	4.98	11.13	5.15	0.953
Computers (including desktop and notebook) located in computer rooms [including Multimedia Learning Center (MMLC), IT Learning Center (ITLC) and Computer Laboratory (CL)]	21.30	14.01	20.18	13.49	0.612
Number of Computer rooms [including Multimedia Learning Center (MMLC), IT Learning Center (ITLC) and Computer Laboratory (CL)]	1.89	1.60	2.60	5.12	0.930
Student to computer gross ratio	1.74	0.83	1.66	0.90	0.590
Student to computer net ratio (excluding computers in the staff rooms and general office)	2.24	1.01	3.05	4.96	0.410
Teacher to computer ratio (computers in staff room)	3.00	3.16	3.18	3.62	0.530
ii. System/Peripheral facilities:					
Wireless LAN	1.34	2.67	2.67	3.91	0.004**
Percentage with at least 1 Wireless LAN	43%		75%		
Video Broadcasting System	0.09	0.43	0.20	0.45	0.109
Electronic Whiteboard for mobile use	0.17	0.35	0.15	0.45	0.555
Sum of Electronic Whiteboard located in different rooms	0.22		0.51		0.509
Digital Projectors (including LCD Projector) for mobile use	2.81	2.36	2.55	2.74	0.172
Digital Projectors located in general classrooms	5.65	5.96	5.98	6.05	0.774
Sum of Digital Projectors (including LCD Projector) located in different rooms	10.03		10.67		0.354
Sum of rooms	25.68		26.62		0.553

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

On average, there were 79.83 (SD: 42.48) computers per school in total (including desktop and notebook) for students and teachers in MS1. No statistically significant difference was observed in the total number of computers in special schools in MS2 (Table 8.83, [E3]ITEdInfoQ3a.i_1,2). Table 8.84 ([E3]ITEdInfoQ3a.i_1,2) shows the distribution of schools with respect to the total number of computers. In MS1, 36% of schools had more than 80 computers. 65% of schools reported having less than 80 computers including 9% of schools having less than 40 computers. In MS2, 40% of schools had more than 80 computers. 60% of schools reported having less than 80 computers including 9% of schools having less than 40 computers.

Table 8.84 Distribution of special schools with respect to total number of computers ([E3] ITEdInfoQ3a.i_1,2)

Total number of computers in school	Percentage (%)	
	MS1 (N=54) #	MS2 (N=55) #
>= 160	6	4
120 - <160	11	9
80 - <120	19	27
40 - <80	56	51
<40	9	9
Total	100	100

Number of schools refers to valid cases related to corresponding computing.

The student-computer ratio and teacher-computer ratio are the indicators to evaluate the adequacy of computers for specific user groups: teachers and students. The average student-to-computer net ratio (excluding computers in staff rooms and general office) for MS1 was 2.24:1 (SD:1.01) (Table 8.83). When taking into account of all computers in school, including those in staff rooms, offices, etc, the student-to-computer gross ratio for MS1 was 1.74:1 (SD:0.83) (Table 8.83). No statistically significant difference was noted in these ratios in MS2. Table 8.85 ([E3]ITEdInfoQ1b,3a.i_1,2,4e_2,f_2) shows the distribution of student-to-computer ratio across special schools. In MS1, all and 96% of the special schools reported having a student-to-computer gross ratio and a student-to-computer net ratio of 4 or less (<=4) to one. In MS2, 98% and 93% of the special schools reported having a student-to-computer gross ratio and a student-to-computer net ratio of 4 or less (<=4) to one.

Table 8.85 Distribution of the special schools with respect to student-computer ratios ([E3]ITEdInfoQ1b,3a.i_1,2, 4e_2,f_2)

Student-computer ratio	Percentage (%)			
	Gross		Net	
	MS1 (N=54) #	MS2 (N=55) #	MS1 (N=54) #	MS2 (N=54) #
5 or above	-	2	4	7
4	6	4	7	0
3	7	2	20	24
2	42	35	46	48
1	44	58	22	20
Total	100	100	100	100

Number of schools refers to valid cases related to corresponding computing. .

The average teacher-to-computer (computers in staff rooms) ratio was 3.00:1 (SD:3.16) in MS1. No statistically significant difference was noted in MS2 (Table 8.83). Table 8.86 ([E3]ITEdInfoQ1c,4e_2) shows the distribution of teacher-to-computer ratio across special schools. In MS1, 68% of schools had a teacher-to-computer ratio of less than four (<4) to one. 38% of schools had a ratio of one to one. 26% of the schools had a ratio of four to less than eight (4-<8) to one and only 6% had a ratio of 8 or more teachers (>=8) to one in staff rooms. In MS2, 40% of schools had a ratio of one to one. 21% of the schools had a ratio of four to less than eight (4-<8) to one and 11% had a ratio of 8 or more teachers (>=8) to one in staff rooms.

Table 8.86 Distribution of schools with respect to teacher-computer ratios ([E3]ITEdInfoQ1c,4e_2)

Teacher-computer ratio	Percentage (%)	
	MS1 (N=50) #	MS2 (N=53) #
>= 12	2	2
8 - <12	4	9
4 - <8	26	21
< 4*	68	68
Total	100	100

Number of schools refers to valid cases related to corresponding computing.
19 (38%) and 21 (40%) special schools had 1:1 teacher-computer ratio in MS1 and MS2 respectively. 4 (8%) and 2 (4%) schools had no computers in staff rooms in MS1 and MS2 respectively.

Students perceived a higher level of sufficiency than teachers on school IT facilities to meet their needs — a statistically significant increase was noted in NC teachers' perceived level of sufficiency in MS2

The adequacy of IT facilities in schools is further examined from the user's perspective. Higher percentage of students than teachers expressed that school IT facilities were sufficient to meet their learning needs. In MS1, 49% of NC and 62% of ID students considered that the IT facilities in schools were sufficient or very sufficient to meet their learning needs, with mean ratings of 3.36 (SD:1.08) and 3.71 (SD:0.87) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 8.87, [E6-1/E6-2/E6-3]SQ7a, [E6-4/E6-5/E6-6]SQ8a). No statistically significant difference was observed for NC students in MS2. 75% of ID students in MS2 perceived that the IT facilities in schools were sufficient or very sufficient to meet their needs.

Teachers were also asked to corroborate their views on the adequacy of school IT facilities to meet students' needs in MS1. 22% of NC and 45% of ID teachers considered the IT facilities in schools as sufficient or very sufficient to meet students' needs, with mean ratings of 2.78 (SD:0.94) and 3.30 (SD:0.83) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant increase was found in NC teachers' (from 22% to 36%) perceived level of this aspect in MS2. 53% of ID teachers in MS2 perceived that these facilities in schools were sufficient to meet their needs (Table 8.87, ([E5]TQ7a).

NC teachers perceived the IT facilities in schools as quite sufficient (一般) to meet their teaching needs whereas ID teachers perceived a higher level of sufficiency in this aspect — a statistically significant increase was noted in NC teachers' perceived level of sufficiency in MS2

With respect to teachers' needs, as reported in MS1, 27% of NC teachers perceived the IT facilities in schools as sufficient or very sufficient to meet their needs whereas 29% of NC teachers considered that they were insufficient or totally insufficient to meet their needs, with a mean rating of 2.93 (SD:0.88) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant increase was noted in NC teachers' (from 27% to 40%) perceived sufficiency level of this aspect in MS2. 49% and 51% of ID teachers in MS1 and MS2 respectively perceived that these facilities were sufficient or very sufficient to meet their needs (Table 8.87a, ([E5]TQ7b).

As for the needs of the therapists, 36% (n=4) and 55% (n=5) of SPH as well as 34% (n=2) and 29% (n=2) of PHY therapists in MS1 and MS2 respectively considered the IT facilities in schools as sufficient or very sufficient to meet their needs. 29% of OC therapists (n=2) in MS1 considered that they were insufficient to meet their needs. 36% (n=4) of them in MS2 perceived that they were sufficient to meet their needs. The mean ratings of the item for SPH, PHY and OC therapists in MS1 were 3.45 (SD:0.93), 2.83 (SD:1.47) and 2.71 (SD:0.49) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. The mean ratings in MS2 were 3.67 (SD:0.71), 3.14 (SD:0.69) and 3.36 (SD:0.50) respectively (Table 8.87b, [E8]THQ6b).

Table 8.87a Teachers' and students' perception of the sufficiency of IT facilities in schools to meet their needs ([E5]TQ7a,b, [E6-1/E6-2/E6-3]SQ7a, [E6-4/E6-5/E6-6]SQ8a)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option					*P*-value
					Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient	
Levels of sufficiency of the IT facilities in schools to meet students' need										
NC Students	MS1	3.36	1.08	80	10 (13)	29 (36)	28 (35)	6 (8)	7 (9)	0.361
	MS2	3.54	0.94	159	28 (18)	49 (31)	66 (42)	13 (8)	3 (2)	
ID Students	MS1	3.71	0.87	126	21 (16)	57 (46)	42 (33)	2 (2)	4 (3)	---
	MS2	3.68	0.81	60	3 (5)	42 (70)	11 (18)	1 (2)	3 (5)	
NC Teachers	MS1	2.78	0.94	103	1 (1)	22 (21)	44 (43)	25 (24)	11 (11)	0.001***
	MS2	3.19	0.87	137	6 (4)	44 (32)	62 (45)	20 (15)	5 (4)	
ID Teachers	MS1	3.30	0.83	88	2 (2)	38 (43)	35 (40)	10 (11)	3 (3)	---
	MS2	3.37	0.79	59	0 (0)	31 (53)	21 (36)	5 (8)	2 (3)	
Levels of sufficiency of the IT facilities in schools meet teachers' need										
NC Teachers	MS1	2.93	0.88	103	1 (1)	27 (26)	45 (44)	24 (23)	6 (6)	0.020*
	MS2	3.21	0.91	137	7 (5)	48 (35)	54 (39)	23 (17)	5 (4)	
ID Teachers	MS1	3.34	0.74	88	0 (0)	43 (49)	33 (38)	11 (13)	1 (1)	----
	MS2	3.41	0.72	59	1 (2)	29 (49)	22 (37)	7 (12)	0 (0)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.87b Therapists' perception of the sufficiency of IT facilities in schools to meet their needs ([E8]THQ6b)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option				
					Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient
Levels of sufficiency of the IT facilities in schools meet therapists' need									
SPH	MS1	3.45	0.93	11	2 (18)	2 (18)	6 (55)	1 (9)	0 (0)
	MS2	3.67	0.71	9	1 (11)	4 (44)	4 (44)	0 (0)	0 (0)
PHY	MS1	2.83	1.47	6	1 (17)	1 (17)	1 (17)	2 (33)	1 (17)
	MS2	3.14	0.69	7	0 (0)	2 (29)	4 (57)	1 (14)	0 (0)
OC	MS1	2.71	0.49	7	0 (0)	0 (0)	5 (71)	2 (29)	0 (0)
	MS2	3.36	0.50	11	0 (0)	4 (36)	7 (64)	0 (0)	0 (0)

Mean: 1="Totally insufficient" and 5="Very sufficient"

Teachers in both MS1 and MS2 perceived the assistive devices in schools as quite sufficient (一般) to meet students' needs whereas students in MS1 perceived a higher level of sufficiency of the assistive devices in school

When students were asked about their needs to use assistive devices when using IT facilities in school, 40% and 50% of NC students as well as 57% and 73% of ID students in MS1 and MS2 respectively expressed their needs (Table 8.88a, [E6-1/E6-3]SQ7f, [E6-4/E6-5/E6-6]SQ8f). 50% and 52% of NC teachers as well as 88% and 90% of ID teachers in MS1 and MS2 respectively thought that their students needed to use assistive devices when using IT facilities (Table 8.88a, [E5]TQ7g). As for the therapists, 55% (n=6) and 78% (n=7) of SPH therapists, all (n=6) and 71% (n=5) of PHY therapists as well as 86% (n=6) and 73% (n=8) of OC therapists in MS1 and MS2 respectively considered that the students needed to use assistive devices when using IT facilities (Table 8.88a, [E8]THQ6g).

Table 8.88a Percentages of teachers/therapists and students reported that students needed assistive devices when using IT facilities in schools ([E5]TQ7g, [E6-1/E6-3]SQ7f, [E6-4/E6-5/E6-6]SQ8f, [E8]THQ6g)

Stakeholders	Special school types	MS1			MS2			*P*-value
		Count	%	N	Count	%	N	
Students	H	0	0	9	3	19	16	
	SSD	-	-	-	-	-	-	
	VI	23	77	30	26	72	36	
	HI	0	0	9	14	58	24	
	ID-M	27	54	50	-	-	-	
	ID-Mmod	9	28	32	8	40	20	
	ID-Mod	18	64	28	26	100	26	
	ID-S	20	100	20	10	71	14	
	PD	0	0	8	9	31	29	
	NC	23	40	57	52	50	105	0.201
	ID	74	57	130	44	73	60	---
Teachers	H	19	37	51	12	24	51	
	SSD	0	0	18	5	33	15	
	VI	20	95	21	16	89	18	
	HI	6	100	6	7	37	19	
	ID-M	16	62	26	-	-	-	
	ID-Mmod	34	100	34	40	100	40	
	ID-Mod	15	100	15	6	67	9	
	ID-S	12	92	13	7	70	10	
	PD	6	100	6	31	91	34	
	NC	51	50	102	71	52	137	0.865
	ID	77	88	88	53	90	59	---
Therapists	SPH	6	55	11	7	78	9	
	PHY	6	100	6	5	71	7	
	OC	6	86	7	8	73	11	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students, teachers and therapists were asked about the adequacy of assistive devices in schools to meet students' needs (Table 8.88b, ([E5]TQ7h, [E6-1/E6-3]SQ7g, [E6-4/E6-5/E6-6]SQ8g, [E8]THQ6h). In MS1, 70% and 33% of NC students and teachers respectively regarded the assistive devices in schools as sufficient or very sufficient, with mean ratings of 3.69 (SD:0.95) and 2.96 (SD:0.93) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted in MS2. Regarding the mean values of the sufficiency of assistive devices in schools among those students who need to use assistive devices when using IT facilities, the lowest were those of ID-S students with a mean rating of 3.00 in MS1 and ID-Mod students with a mean rating of 2.04 in MS2. On the other hand, 63% and 27% of ID students and teachers thought that the assistive devices in schools were sufficient or very sufficient, with mean ratings of 3.57 (SD:0.97) and 2.96 (SD:0.90) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. 32% and 27% of them respectively in MS2 perceived such devices were sufficient or very sufficient, with mean rating of 2.73 (SD:0.92) and 3.13 (SD:0.68).

With respect to the responses from the teachers whose students are in need of using the assistive devices when using IT facilities, H teachers perceived the lowest level of sufficiency in assistive devices in school with a mean rating of 2.32 (SD:0.82), followed by ID-S [2.75 (SD:1.06)], ID-M [2.88 (SD:0.89)], ID-Mod [2.93 (SD:1.22)], HI [3.00 (SD:0.63)], ID-Mmod [3.09 (SD:0.67)], VI [3.45 (SD:0.83)] and PD [3.50 (SD:0.55)] in MS1. In MS2, ID-Mod teachers perceived the lowest level of sufficiency in assistive facilities with a mean rating of 2.83 (SD:0.41), followed by H [2.92 (SD:0.90)]. For therapists' point of view, 34% and 29% of SPH (n=2) as well as 67% and 80% of PHY therapists (n=4) in MS1 and MS2 respectively considered that the assistive devices in schools were sufficient or very sufficient to meet students' need, with mean ratings of 3.29-3.50 (SD:0.49-0.84)

and 3.33-3.80 (SD:1.03-1.10) on a scale of 1 to 5 where 1 was ‘totally insufficient’ and 5 was ‘very sufficient’. In contrast, none and 25% of the OC therapist (n=2)in MS1 and MS2 respectively considered that they were sufficient. 34% and 25% of them (n=2) in MS1 and MS2 respectively considered that they were insufficient or totally insufficient, with a mean rating of 2.50 (SD:0.84) and 3.00 (SD:0.76) ([E8]THQ6h).

Table 8.88b Teachers'/Therapists' and students' perception of the sufficiency of assistive devices in schools to meet students' needs ([E5]TQ7h, [E6-1/E6-3]SQ7g, [E6-4/E6-5/E6-6]SQ8g, [E8]THQ6h)

Stakeholders	Special school types	MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of choosing the option							Mean (1-5)	SD	N	Count (%) of choosing the option							
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient									
Students	H	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.67	0.58	3	0	(0)	2	(67)	1	(33)	0	(0)	0	(0)	
	SSD	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	VI	3.74	0.81	23	3	(13)	13	(57)	5	(22)	2	(9)	0	(0)	3.46	0.71	26	0	(0)	14	(54)	11	(42)	0	(0)	1	(4)	
	HI	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.07	0.83	14	0	(0)	5	(36)	5	(36)	4	(29)	0	(0)	
	ID-M	3.81	1.04	27	8	(30)	9	(33)	8	(30)	1	(4)	1	(4)	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	ID-Mmod	3.44	1.24	9	1	(11)	5	(56)	1	(11)	1	(11)	1	(11)	3.75	0.71	8	0	(0)	7	(88)	0	(0)	1	(13)	0	(0)	
	ID-Mod	3.89	0.32	18	0	(0)	16	(89)	2	(11)	0	(0)	0	(0)	2.04	0.20	26	0	(0)	0	(0)	1	(4)	25	(96)	0	(0)	
	ID-S	3.00	0.92	20	0	(0)	8	(40)	4	(20)	8	(40)	0	(0)	3.70	0.48	10	0	(0)	7	(70)	3	(30)	0	(0)	0	(0)	
	PD	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.00	1.32	9	1	(11)	3	(33)	1	(11)	3	(33)	1	(11)	
	NC	3.69	0.95	23	3	(13)	13	(57)	5	(22)	2	(9)	0	(0)	3.29	0.87	52	1	(2)	24	(46)	18	(35)	7	(13)	2	(4)	0.059
	ID	3.57	0.97	74	9	(12)	38	(51)	15	(20)	10	(14)	2	(3)	2.73	0.92	44	0	(0)	14	(32)	4	(9)	26	(59)	0	(0)	---
Teachers	H	2.32	0.82	19	0	(0)	2	(11)	4	(21)	11	(58)	2	(11)	2.92	0.90	12	1	(8)	1	(8)	6	(50)	4	(33)	0	(0)	
	SSD	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.20	1.30	5	0	(0)	3	(60)	1	(20)	0	(0)	1	(20)	
	VI	3.45	0.83	20	1	(5)	10	(50)	6	(30)	3	(15)	0	(0)	3.19	0.66	16	0	(0)	5	(31)	9	(56)	2	(13)	0	(0)	
	HI	3.00	0.63	6	0	(0)	1	(17)	4	(67)	1	(17)	0	(0)	3.00	1.00	7	1	(14)	0	(0)	4	(57)	2	(29)	0	(0)	
	ID-M	2.88	0.89	16	0	(0)	4	(25)	7	(44)	4	(25)	1	(6)	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	ID-Mmod	3.09	0.67	34	0	(0)	9	(26)	19	(56)	6	(18)	0	(0)	3.10	0.67	40	0	(0)	11	(28)	22	(55)	7	(18)	0	(0)	
	ID-Mod	2.93	1.22	15	1	(7)	4	(27)	6	(40)	1	(7)	3	(20)	2.83	0.41	6	0	(0)	0	(0)	5	(83)	1	(17)	0	(0)	
	ID-S	2.75	1.06	12	0	(0)	3	(25)	5	(42)	2	(17)	2	(17)	3.57	0.79	7	1	(14)	2	(29)	4	(57)	0	(0)	0	(0)	
	PD	3.50	0.55	6	0	(0)	3	(50)	3	(50)	0	(0)	0	(0)	3.23	0.72	31	0	(0)	12	(39)	14	(45)	5	(16)	0	(0)	
	NC	2.96	0.93	54	1	(2)	17	(31)	17	(31)	17	(31)	2	(4)	3.14	0.80	71	2	(3)	21	(30)	34	(48)	13	(18)	1	(1)	0.298
	ID	2.96	0.90	77	1	(1)	20	(26)	37	(48)	13	(17)	6	(8)	3.13	0.68	53	1	(2)	13	(25)	31	(58)	8	(15)	0	(0)	---
Therapists	SPH	3.50	0.84	6	1	(17)	1	(17)	4	(67)	0	(0)	0	(0)	3.29	0.49	7	0	(0)	2	(29)	5	(71)	0	(0)	0	(0)	
	PHY	3.33	1.03	6	0	(0)	4	(67)	0	(0)	2	(33)	0	(0)	3.80	1.10	5	1	(20)	3	(60)	0	(0)	1	(20)	0	(0)	
	OC	2.50	0.84	6	0	(0)	0	(0)	4	(67)	1	(17)	1	(17)	3.00	0.76	8	0	(0)	2	(25)	4	(50)	2	(25)	0	(0)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.5.1.2 Connectivity and Internet/Intranet Services

All schools had broadband Internet connection in MS1 — a statistically significant increase was noted in the percentage of schools having a connection speed of 10Mbps or higher in MS2

Connectivity to the Internet is another aspect that has prominent effect on learning and teaching with IT. All special schools in MS1 and 96% of them in MS2 reported having broadband Internet connection. 59% and 45% of schools respectively had a connection speed of 3Mbps to less than 10Mbps in MS1 and MS2. 24% and 40% of schools respectively had a connection speed of 10Mbps or higher in MS1 and MS2. A statistically significant increase was noted in the percentage of schools having a connection speed of 10Mbps or higher in MS2 (Table 8.89, [E3]ITEdInfoQ5a,b).

82% and 33% of schools in MS1 respectively provided intranets and e-learning platforms — a statistically significant increase was noted in the percentage of schools providing e-learning platforms in MS2

With regard to the Internet service provided by schools, Table 8.89 ([E3]ITEdInfoQ6a) shows the percentages of schools with school websites, teachers' or students' homepages, e-learning platforms, intranets and email accounts for teachers, students and parents. All and 95% of schools had school websites in MS1 and MS2 respectively. 82% and 87% of schools respectively had school intranets in MS1 and MS2. A statistically significant increase was noted in the percentage of schools with e-learning platforms from 33% in MS1 to 53% in MS2.

Table 8.89 Percentage of schools with Internet connection, school homepages/teachers' homepages/students' homepages/e-learning platforms and intranet ([E3]ITEdInfoQ5a,b,6a)

	IT facilities	MS1 (N=55)	MS2 (N=55)	*P*-value
i.	**Internet Connection**			
	Broadband	100	96	0.155
	Speed of connection: 3 Mbps to less than 10 Mbps	59	45	0.016*
	10Mbps or higher	24	40	
ii.	**Intranet/internet Services**			
	School homepage	100	95	0.080
	E-learning platform	33	53	0.035*
	School Intranet	82	87	0.431
	Teachers' homepage	18	7	0.088
	Students' homepage	11	4	0.144

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers and students tended to be satisfied with the speed of Internet connection in schools, except for NC teachers in MS1 who perceived a lower level of satisfaction with this aspect

The speed of Internet connection in schools is further examined from the users' perspective (Table 8.90, ([E5]TQ7e, [E6-1/E6-2/E6-3]SQ7c, [E6-4/E6-5/E6-6]SQ8c, [E8]THQ6e). In MS1, 48% and 40% of NC students and teachers respectively were satisfied or very satisfied with the speed of Internet connection in schools, with mean ratings of 3.31 (SD:0.98) and 2.92 (SD:1.18) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. A statistically significant increase was noted in teachers' side (from 40% to 52%) in MS2 whereas similar finding was observed in students' side. 55% and 70% of ID students as well as 57% and 63% of ID teachers in MS1 and MS2 were satisfied or very satisfied with this aspect. The mean values for ID students and teachers were 3.45-3.80 (SD:0.71-0.99) and 3.48-3.51 (SD:0.74-0.75) respectively. Therapists were more satisfied with the speed of Internet connection in schools than that of the teachers. 36% (n=4) and 89% (n=8) of SPH, 83% (n=5) and all (n=7) of PHY as well as 14% (n=1) and 73% (n=8) of OC therapists in MS1 and MS2 respectively were satisfied with the speed of Internet connection in schools, with mean ratings of 3.18-3.89 (SD:0.33-0.75), 3.50-4.14 (SD:0.38-1.22) and 3.00-3.82 (SD:0.58-0.60).

Table 8.90 Teachers'/Therapists' and students' perception of the levels of satisfaction with the speed of Internet connection in schools ([E5]TQ7e, [E6-1/E6-2/E6-3]SQ7c, [E6-4/E6-5/E6-6]SQ8c, [E8]THQ6e)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
NC Students	MS1	3.31	0.98	74	5	(7)	30	(41)	27	(36)	7	(9)	5	(7)	0.078
	MS2	3.54	0.96	151	26	(17)	51	(34)	55	(36)	16	(11)	3	(2)	
ID Students	MS1	3.45	0.99	130	12	(10)	58	(45)	43	(33)	7	(5)	9	(7)	---
	MS2	3.80	0.71	60	8	(13)	34	(57)	16	(27)	2	(3)	0	(0)	
NC Teachers	MS1	2.92	1.18	103	4	(4)	37	(36)	27	(26)	17	(17)	18	(17)	0.023*
	MS2	3.26	1.04	136	6	(4)	65	(48)	37	(27)	15	(11)	13	(10)	
ID Teachers	MS1	3.48	0.74	88	2	(2)	48	(55)	29	(33)	8	(9)	1	(1)	---
	MS2	3.51	0.75	59	0	(0)	37	(63)	17	(29)	3	(5)	2	(3)	
SPH	MS1	3.18	0.75	11	0	(0)	4	(36)	5	(45)	2	(18)	0	(0)	---
	MS2	3.89	0.33	9	0	(0)	8	(89)	1	(11)	0	(0)	0	(0)	
PHY	MS1	3.50	1.22	6	0	(0)	5	(83)	0	(0)	0	(0)	1	(17)	---
	MS2	4.14	0.38	7	1	(14)	6	(86)	0	(0)	0	(0)	0	(0)	
OC	MS1	3.00	0.58	7	0	(0)	1	(14)	5	(71)	1	(14)	0	(0)	---
	MS2	3.82	0.60	11	1	(9)	7	(64)	3	(27)	0	(0)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.5.1.3 Computer Consumables

Teachers and students tended to perceive consumables in schools as sufficient, except NC teachers who perceived a lower level of sufficiency in this aspect

Schools should provide sufficient consumables such as paper and toner for printers to support learning and teaching. Table 8.91 ([E5]TQ7f, [E6-1/E6-2/E6-3]SQ7d, [E6-4/E6-5/E6-6]SQ8d, [E8]THQ6f) shows the teachers'/therapists' and students' perception of the sufficiency of consumables in schools. In MS1, 54% and 38% of NC students and teachers respectively expressed that consumables were sufficient or very sufficient, with mean ratings of 3.30 (SD:1.01) and 2.92 (SD:1.15) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. A statistically significant increase was noted in teachers' side (from 38% to 49%) in MS2 whereas no difference was observed in students' side. Around 50% and 60% of ID teachers and students respectively in MS1 and MS2 expressed that consumables were sufficient or very sufficient, with mean ratings of 3.53-3.60 (SD:0.85-0.94) and 3.43-3.44 (SD:0.83-0.84) respectively. Therapists showed more positive views on the sufficiency of the computer consumables in schools. 45% (n=5) and 67% (n=6) of SPH, 84% (n=5) and 86% (n=6) of PHY as well as 57% (n=4) and 64% (n=7) of OC therapists in MS1 and MS2 respectively regarded the computer consumables as sufficient or very sufficient with mean ratings of 3.56-3.73 (SD:0.73-0.90), 3.67-3.86 (SD:0.38-1.37) and 3.43-3.64 (SD: 0.81-1.13) ([E8]THQ6f).

Table 8.91 Teachers'/Therapists' and students' perception of the sufficiency of consumables (e.g. paper and toner for printers) in schools ([E5]TQ7f, [E6-1/E6-2/E6-3]SQ7d, [E6-4/E6-5/E6-6]SQ8d, [E8]THQ6f)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										P-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
NC Students	MS1	3.30	1.01	76	3	(4)	38	(50)	20	(26)	9	(12)	6	(8)	0.509
	MS2	3.36	1.11	152	28	(18)	38	(25)	54	(36)	24	(16)	8	(5)	
ID Students	MS1	3.60	0.94	128	17	(13)	63	(49)	32	(25)	12	(9)	4	(3)	---
	MS2	3.53	0.85	60	2	(3)	37	(62)	15	(25)	3	(5)	3	(5)	
NC Teachers	MS1	2.92	1.15	103	5	(5)	34	(33)	27	(26)	22	(21)	15	(15)	0.013*
	MS2	3.31	1.05	136	14	(10)	53	(39)	37	(27)	25	(18)	7	(5)	
ID Teachers	MS1	3.43	0.83	88	6	(7)	38	(43)	33	(38)	10	(11)	1	(1)	---
	MS2	3.44	0.84	59	3	(5)	28	(47)	22	(37)	4	(7)	2	(3)	
SPH	MS1	3.73	0.90	11	3	(27)	2	(18)	6	(55)	0	(0)	0	(0)	---
	MS2	3.56	0.73	9	0	(0)	6	(67)	2	(22)	1	(11)	0	(0)	
PHY	MS1	3.67	1.37	6	1	(17)	4	(67)	0	(0)	0	(0)	1	(17)	---
	MS2	3.86	0.38	7	0	(0)	6	(86)	1	(14)	0	(0)	0	(0)	
OC	MS1	3.43	1.13	7	1	(14)	3	(43)	1	(14)	2	(29)	0	(0)	---
	MS2	3.64	0.81	11	1	(9)	6	(55)	3	(27)	1	(9)	0	(0)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.5.1.4 Provision of Computer Facilities beyond School Hours

School heads tended to be satisfied with the provision of sufficient IT facilities for students beyond school hours

The provision of computer facilities beyond school hours is also important to support students' learning with the use of IT. As reported in Section 8.7.3, 79% of special schools had opened computer rooms for students after school in MS1 and MS2 (Table 8.129, [E2-1/E2-2]HQ10a). In MS1, 61% of school heads were satisfied or very satisfied with the provision of sufficient IT facilities for students beyond school hours. No statistically significant difference was found in MS2 (Table 8.92, [E1-1/E1-2]HSQ6g).

Table 8.92 School heads' levels of satisfaction with the provision of sufficient IT facilities for students beyond school hours ([E1-1/E1-2]HSQ6g)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option										*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"The school provides sufficient IT facilities for students beyond school hours."														
MS1	3.69	0.80	54	7	(13)	26	(48)	19	(35)	1	(2)	1	(2)	0.635
MS2	3.73	0.87	52	8	(15)	26	(50)	16	(31)	0	(0)	2	(4)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

NC students considered the opening hours of computer rooms beyond school hours as quite sufficient (一般) while ID students tended to perceive such service as sufficient

When students were asked about the sufficiency of opening hours of computer facilities after school, 42% of NC students in MS1 considered the opening hours to be sufficient or very sufficient, with a mean rating of 3.18 (SD:1.10) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted for NC students in this aspect in MS2. 66% and 51% of ID students in MS1 and MS2 respectively regarded the opening hours to be sufficient or very sufficient, with mean rating of 3.70 (SD:0.89) and 3.51 (SD:0.85) (Table 8.93, [E6-1/E6-2/E6-3]SQ7e, [E6-4/E6-5/E6-6] SQ8e)

Table 8.93 Students' perception of the levels of sufficiency regarding the opening hours of computer rooms beyond school hours ([E6-1/E6-2/E6-3]SQ7e, [E6-4/E6-5/E6-6] SQ8e)

Special school types		Mean (1-5)	SD	N	Count (%) choosing the option					P-value
					Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient	
NC	MS1	3.18	1.10	71	7 (10)	23 (32)	23 (32)	12 (17)	6 (8)	0.570
	MS2	2.98	1.11	130	11 (8)	30 (23)	50 (38)	24 (18)	15 (12)	
ID	MS1	3.70	0.89	111	17 (15)	57 (51)	28 (25)	7 (6)	3 (3)	---
	MS2	3.51	0.85	35	4 (11)	14 (40)	13 (37)	4 (11)	0 (0)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.5.2 Management and Maintenance of IT Facilities and Technical Support Services

School heads were satisfied with the quality IT management, maintenance and technical support services provided by their schools for students and teachers/therapists

While a well-established infrastructure and sufficient IT facilities in schools are important to the successful implementation of ITEd, other factors such as effective management and maintenance of IT facilities and efficient technical support services are also crucial. In MS1, most of school heads (93%) were satisfied or very satisfied with the quality IT management, maintenance and technical support services provided by their schools for students and teachers/ therapists. No statistically significant difference was found in MS2 (Table 8.94, [E1-1/E1-2]HSQ6e).

Table 8.94 School heads' levels of satisfaction with IT management, maintenance and technical support services ([E1-1/E1-2]HSQ6e)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school provides quality IT management, maintenance and technical support services for students and teachers/therapists"									
MS1	4.06	0.45	54	7 (13)	43 (80)	4 (7)	0 (0)	0 (0)	0.464
MS2	3.98	0.58	52	8 (15)	35 (67)	9 (17)	0 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived that it was quite easy (一般) to get support when encountering technical problems in using computers, except ID students in MS2 who perceived a lower level of easiness to get such support

When looking into the easiness of getting technical support (Table 8.95, [E6-1]SQ8a, [E6-2/E6-3]SQ9a, [E6-4/E6-5/E6-6]SQ10a), 32% of NC students in MS1 considered that it was easy or very easy to get such support when they encountered technical problems while 16% of NC of them found that it was not easy or not easy at all to get such support, with a mean rating of 3.15 (SD:0.94) on a scale of 1 to 5 where 1 was 'not easy at all' and 5 was 'very easy'. No statistically significant difference was noted for NC students in this aspect in MS2. 20% and 15% of ID students in MS1 and MS2 respectively perceived it was easy or very east to get such support, with mean ratings of 2.96 (SD:0.95) and 2.52 (SD:0.95).

Table 8.95 Students' perception of the levels of easiness in getting support when encountering technical problems in using the computers ([E6-1]SQ8a, [E6-2/E6-3]SQ9a, [E6-4/E6-5/E6-6]SQ10a)

Special school types		Mean (1-5)	SD	N	Count (%) Students choosing the option					P-value
					Very easy	Easy	Quite easy (一般)	Not easy	Not easy at all	
NC	MS1	3.15	0.94	81	5 (6)	21 (26)	42 (52)	7 (9)	6 (7)	0.916
	MS2	3.13	1.10	159	23 (14)	28 (18)	66 (42)	31 (19)	11 (7)	
ID	MS1	2.96	0.95	124	9 (7)	17 (13)	68 (55)	21 (17)	9 (7)	---
	MS2	2.52	0.95	60	2 (3)	7 (12)	17 (28)	28 (47)	6 (10)	

Mean: 1="Not easy at all" and 5="Very easy"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Teachers considered the technical support provided by IT technicians in schools as the most satisfactory channel

With regard to the channels from which the teachers could seek technical support, in MS1, 32% to 57% of the special school teachers indicated that they did not seek the technical support from the "EMB" (57% of NC and 47% of ID)," "other technical support service provider" (52% of NC and 44% of ID), "school-based technical support service provider" (44% of NC and 38% of ID) and the "HKEdCity" (44% of NC and 32% of ID). 72% of NC and 73% of ID teachers considered the support from "IT technicians in school" as satisfied or very satisfied, followed by "ITEd team members" (60% of NC and 66% of ID), "other colleagues in school" (53% of NC and 66% of ID) as well as "friends and relatives" (56% of NC and 49% of ID). 29% of NC and 53% of ID teachers were satisfied or very satisfied with the technical support from "HKEdCity". Other support channels from the EMB such as Centres of Excellence (CoEs) and ITEd Support Service Centre (ITeHelp) were considered as satisfied by 18% of NC and 19% of ID teachers, with mean ratings of 3.00 (SD:0.60) and 3.02 (SD:0.68) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was noted in MS2 for NC teachers. As for ID teachers in MS2, 53%-76% of them considered the support from the following channels as satisfied or very satisfied: "IT technicians in school" (76%), "ITEd team members in school" (68%), "other colleagues in school" (67%), the "HKEdCity" (54%) as well as "friends and relatives" (53%) (Table 8.96a, [E5]TQ9b.i-ix).

With regard to the channels from which the therapists could seek technical support, 36% to 86% of the special school therapists in MS1 and MS2 indicated that they did not seek the technical support from the "EMB", "other technical support service provider", "school-based technical support service provider" and the "HKEdCity". In MS1, 73% of SPH (n=8) and 66% of PHY therapists (n=4) considered the support from "ITEd team members in schools" as satisfied or very satisfied. Similar proportions of SPH and PHY therapists [73% of SPH (n=8) and 67% of PHY (n=4)] considered the support from "IT technicians in schools" as satisfied or very satisfied. 66% of PHY (n=2) and 60% of OC therapists (n=3) considered the technical support from "friends and relatives" as satisfied or very satisfied. PHY and OC therapists were less satisfied with the support from the "school-based technical support service provider" and "other technical support service provider". 33% of PHY (n=1) and 50% of OC therapists (n=1) as well as 50% of PHY (n=1) and all OC therapists (n=1) were not satisfied or totally not satisfied with these two technical support channels respectively. 43% of OC therapists (n=3) were not satisfied with the support from "IT technicians in school". In MS2, 50%-60% of the therapists [SPH=50%(n=4%), PHY=60%(n=3), OC=50%(n=3)] were satisfied with the support from "friends and relatives". 85% (n=6) of PHY and 73% of OC therapists (n=8) were satisfied or very satisfied with the support from "IT technicians in school". 71% of PHY (n=5) and 73% of OC therapists (n=8) were satisfied or very satisfied with the support from "other colleagues in school" and "ITEd team members in school" respectively (Table 8.96b, [E8]THQ8b.i-ix).

Table 8.96a Teachers' levels of satisfaction with the technical support from different channels when encountering technical problems in using the computers ([E5]TQ9b.i-ix)

Special school types	Channels of technical support	MS1 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	No related technical support channels (不曾要求有關支援)	MS2 Mean (1-5)	SD	N	Count (%) of Teachers choosing the option: Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	No related technical support channels (不曾要求有關支援)	*P*-value
NC	i.	3.66	0.72	95	10 (11)	47 (49)	34 (36)	4 (4)	0 (0)	8 (8)	3.58	0.74	126	9 (7)	64 (51)	45 (36)	7 (6)	1 (1)	11 (8)	0.513
	ii.	3.80	0.80	102	16 (16)	57 (56)	23 (23)	5 (5)	1 (1)	1 (0)	3.67	0.73	132	12 (9)	72 (55)	42 (32)	5 (4)	1 (1)	4 (3)	0.124
	iii.	3.58	0.66	96	7 (7)	44 (46)	43 (45)	2 (2)	0 (0)	7 (0)	3.50	0.65	127	8 (6)	51 (40)	65 (51)	3 (2)	0 (0)	9 (7)	0.341
	iv.	3.19	0.71	58	1 (2)	17 (29)	33 (57)	6 (10)	1 (2)	45 (44)	3.29	0.63	85	2 (2)	27 (32)	50 (59)	6 (7)	0 (0)	51 (37)	0.459
	v.	3.16	0.68	50	1 (2)	13 (26)	29 (58)	7 (14)	0 (0)	53 (52)	3.20	0.67	82	2 (2)	22 (27)	48 (59)	10 (12)	0 (0)	55 (40)	0.787
	vi.	3.00	0.60	45	0 (0)	8 (18)	29 (64)	8 (18)	0 (0)	58 (57)	2.88	0.67	59	0 (0)	8 (14)	38 (64)	11 (19)	2 (3)	78 (57)	0.438
	vii.	3.29	0.65	58	3 (5)	14 (24)	38 (66)	3 (5)	0 (0)	45 (44)	3.36	0.67	75	3 (4)	26 (35)	41 (55)	5 (7)	0 (0)	61 (45)	0.430
	viii.	3.64	0.77	94	12 (13)	40 (43)	39 (41)	2 (2)	1 (1)	9 (1)	3.55	0.68	111	6 (5)	55 (50)	44 (40)	6 (5)	0 (0)	26 (19)	0.473
	ix.	3.25	1.71	4	1 (25)	1 (25)	1 (25)	0 (0)	1 (25)	99 (97)	3.50	1.07	8	0 (0)	6 (75)	1 (13)	0 (0)	1 (13)	2 (1)	0.933
ID	i.	3.66	0.72	83	5 (6)	50 (60)	25 (30)	1 (1)	2 (2)	5 (1)	3.75	0.58	57	4 (7)	35 (61)	18 (32)	0 (0)	0 (0)	2 (3)	---
	ii.	3.77	0.74	88	9 (10)	55 (63)	21 (24)	1 (1)	2 (2)	0 (0)	3.84	0.67	58	7 (12)	37 (64)	12 (21)	2 (3)	0 (0)	1 (2)	---
	iii.	3.66	0.61	87	2 (2)	56 (64)	27 (31)	1 (1)	1 (1)	1 (0)	3.71	0.53	58	2 (3)	37 (64)	19 (33)	0 (0)	0 (0)	1 (2)	---
	iv.	3.44	0.69	55	2 (4)	23 (42)	28 (51)	1 (2)	1 (2)	33 (38)	3.22	0.42	36	0 (0)	8 (22)	28 (78)	0 (0)	0 (0)	23 (39)	---
	v.	3.28	0.61	50	0 (0)	17 (34)	31 (62)	1 (2)	1 (2)	38 (44)	3.36	0.54	36	1 (3)	11 (31)	24 (67)	0 (0)	0 (0)	23 (39)	---
	vi.	3.02	0.68	47	0 (0)	9 (19)	32 (68)	4 (9)	2 (4)	41 (47)	3.26	0.44	35	0 (0)	9 (26)	26 (74)	0 (0)	0 (0)	24 (41)	---
	vii.	3.48	0.72	60	2 (3)	30 (50)	24 (40)	3 (5)	1 (2)	28 (32)	3.49	0.69	37	1 (3)	19 (51)	14 (38)	3 (8)	0 (0)	22 (37)	---
	viii.	3.40	0.77	70	2 (3)	32 (46)	30 (43)	4 (6)	2 (3)	17 (20)	3.31	0.95	51	2 (4)	25 (49)	13 (25)	9 (18)	2 (4)	8 (14)	---
	ix.	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	2 (67)	4.00	0.00	1	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	58 (98)	---

Channels of technical support

i. ITEd team members in school
ii. IT technician(s) in school
iii. Other Colleagues in school
iv. School-based technical support service provider
v. Other technical support service provider
vi. Education and Manpower Bureau (EMB) [e.g. Centres of Excellence(CoEs) , ITEd Support Service Centre (ITeHelp)]
vii. HKEdCity
viii. Friends and relatives
ix. Others

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.
N=Valid count (N) (excluding no. of teachers choosing 'No related technical support channels')

Table 8.96b Therapists' levels of satisfaction with the technical support from different channels when encountering technical problems in using the computers ([E8]THQ8b.i-ix)

Special school types	Channels of technical support	MS1 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	No related technical support channels (不曾要求有關支援)	MS2 Mean (1-5)	SD	N	Count (%) of Therapists choosing the option: Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	No related technical support channels (不曾要求有關支援)
SPH	i.	3.82	0.60	11	1 (9)	7 (64)	3 (27)	0 (0)	0 (0)	0 (0)	3.44	0.73	9	1 (11)	2 (22)	6 (67)	0 (0)	0 (0)	0 (0)
	ii.	3.73	0.47	11	0 (0)	8 (73)	3 (27)	0 (0)	0 (0)	0 (0)	3.67	0.87	9	2 (22)	2 (22)	5 (56)	0 (0)	0 (0)	0 (0)
	iii.	3.33	0.50	9	0 (0)	3 (33)	6 (67)	0 (0)	0 (0)	2 (18)	3.56	0.73	9	1 (11)	3 (33)	5 (56)	0 (0)	0 (0)	0 (0)
	iv.	3.40	0.55	5	0 (0)	2 (40)	3 (60)	0 (0)	0 (0)	6 (55)	3.20	0.45	5	0 (0)	1 (20)	4 (80)	0 (0)	0 (0)	4 (44)
	v.	3.25	0.50	4	0 (0)	1 (25)	3 (75)	0 (0)	0 (0)	7 (64)	3.00	0.00	5	0 (0)	0 (0)	5 (100)	0 (0)	0 (0)	4 (44)
	vi.	3.33	0.58	3	0 (0)	1 (33)	2 (67)	0 (0)	0 (0)	8 (73)	2.75	0.50	4	0 (0)	0 (0)	3 (75)	1 (25)	0 (0)	5 (56)
	vii.	3.50	0.58	4	0 (0)	2 (50)	2 (50)	0 (0)	0 (0)	7 (64)	2.40	0.89	5	0 (0)	0 (0)	3 (60)	1 (20)	1 (20)	4 (44)
	viii.	3.60	0.70	10	1 (10)	4 (40)	5 (50)	0 (0)	0 (0)	1 (9)	3.50	0.53	8	0 (0)	4 (50)	4 (50)	0 (0)	0 (0)	1 (11)
	ix.	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	9 (100)
PHY	i.	3.67	1.51	6	2 (33)	2 (33)	1 (17)	0 (0)	1 (17)	0 (0)	3.43	0.53	7	0 (0)	3 (43)	4 (57)	0 (0)	0 (0)	0 (0)
	ii.	3.83	1.60	6	3 (50)	1 (17)	1 (17)	0 (0)	1 (17)	0 (0)	4.00	0.58	7	1 (14)	5 (71)	1 (14)	0 (0)	0 (0)	0 (0)
	iii.	3.17	0.75	6	0 (0)	2 (33)	3 (50)	1 (17)	0 (0)	0 (0)	3.71	0.49	7	0 (0)	5 (71)	2 (29)	0 (0)	0 (0)	0 (0)
	iv.	2.67	0.58	3	0 (0)	0 (0)	2 (67)	1 (33)	0 (0)	3 (50)	3.00	0.00	3	0 (0)	0 (0)	3 (100)	0 (0)	0 (0)	4 (57)
	v.	2.50	0.71	2	0 (0)	0 (0)	1 (50)	1 (50)	0 (0)	4 (67)	3.00	0.00	3	0 (0)	0 (0)	3 (100)	0 (0)	0 (0)	4 (57)
	vi.	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	5 (83)	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	6 (86)
	vii.	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	5 (83)	3.00	0.00	2	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	5 (71)
	viii.	4.00	1.00	3	1 (33)	1 (33)	1 (33)	0 (0)	0 (0)	3 (50)	3.60	0.55	5	0 (0)	3 (60)	2 (40)	0 (0)	0 (0)	2 (29)
	ix.	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	6 (100)	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)
OC	i.	3.00	0.82	7	0 (0)	2 (29)	3 (43)	2 (29)	0 (0)	0 (0)	3.82	0.60	11	1 (9)	7 (64)	3 (27)	0 (0)	0 (0)	0 (0)
	ii.	2.86	0.90	7	0 (0)	2 (29)	2 (29)	3 (43)	0 (0)	0 (0)	3.82	0.60	11	1 (9)	7 (64)	3 (27)	0 (0)	0 (0)	0 (0)
	iii.	3.00	0.82	7	0 (0)	2 (29)	3 (43)	2 (29)	0 (0)	0 (0)	3.30	0.67	10	0 (0)	4 (40)	5 (50)	1 (10)	0 (0)	1 (9)
	iv.	2.50	0.71	2	0 (0)	0 (0)	1 (50)	1 (50)	0 (0)	5 (71)	3.43	0.79	7	0 (0)	4 (57)	2 (29)	1 (14)	0 (0)	4 (36)
	v.	2.00	0.00	1	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	6 (86)	3.00	0.63	6	0 (0)	1 (17)	4 (67)	1 (17)	0 (0)	5 (45)
	vi.	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	6 (86)	2.67	0.82	6	0 (0)	0 (0)	5 (83)	0 (0)	1 (17)	5 (45)
	vii.	3.00	0.00	1	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	6 (86)	3.00	0.00	6	0 (0)	0 (0)	6 (100)	0 (0)	0 (0)	5 (45)
	viii.	4.00	1.00	5	2 (40)	1 (20)	2 (40)	0 (0)	0 (0)	2 (29)	3.50	0.55	6	0 (0)	3 (50)	3 (50)	0 (0)	0 (0)	5 (45)
	ix.	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (100)	0.00	0.00	0	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)

Channels of technical support

i. ITEd team members in school
ii. IT technician(s) in school
iii. Other Colleagues in school
iv. School-based technical support service provider
v. Other technical support service provider
vi. Education and Manpower Bureau (EMB) [e.g. Centres of Excellence(CoEs) , ITEd Support Service Centre (ITeHelp)]*
vii. HKEdCity
viii. Friends and relatives
ix. Others

Mean: 1="Totally not satisfied" and 5="Very satisfied"
N=Valid count (N) (excluding no. of therapists choosing 'No related technical support channels')
*Information Technology in Education Support Centre Service

8.5.3 Upgrading IT Facilities and Exploring Advanced IT Technology

School heads were satisfied that their schools continually upgraded IT facilities and explored advanced IT technology for learning and teaching/therapy

Upgrading IT facilities and exploring advanced information technologies for enhancing learning and teaching are other key aspects for successful implementation of ITEd. In MS1, 89% of school heads were satisfied or very satisfied that their schools continually improved the IT infrastructure and renewed equipment to effectively support the present day learning and teaching/therapy needs. 78% of them were satisfied or very satisfied that their schools continually improved IT infrastructure with advanced technology to enhance the effectiveness in learning, teaching, assessment and school administration. No statistically significant difference was observed in school heads' levels of satisfaction with both areas in MS2 (Table 8.97, [E1-1/E1-2]HSQ6h,i).

Table 8.97 School heads' levels of satisfaction with the improvement of IT infrastructure ([E1-1/E1-2]HSQ6h,i)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school continually improves the IT infrastructure and renews equipment to effectively support the present day learning and teaching/therapy needs."									
MS1	4.02	0.49	54	7 (13)	41 (76)	6 (11)	0 (0)	0 (0)	0.555
MS2	4.08	0.55	52	10 (19)	36 (69)	6 (12)	0 (0)	0 (0)	
"The school continually improves IT infrastructure with advanced technology to enhance the effectiveness in learning, teaching, assessment and school administration."									
MS1	3.87	0.67	54	7 (13)	35 (65)	10 (19)	2 (4)	0 (0)	0.384
MS2	4.00	0.59	52	9 (17)	34 (65)	9 (17)	0 (0)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived a higher level of sufficiency on IT infrastructure than that of teachers to meet their needs

Table 8.98 ([E5]TQ7c,d, [E6-1/E6-2/E6-3]SQ7b, [E6-4/E6-5/E6-6]SQ8b, [E8]THQ6d) presents the teachers'/therapists and students' perceived levels of sufficiency of IT infrastructure to meet their needs. In MS1, 28% and 51% of NC teachers and students respectively considered the IT infrastructure such as upgraded computer model and computer operating system in their schools as sufficient or very sufficient to meet their learning or teaching needs whereas 26% and 17% of them considered them as insufficient or totally insufficient. The mean ratings of the item for teachers and students were 2.97 (SD:0.90) and 3.34 (SD:0.99) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was identified in MS2. As for ID needs, 56% and 75% of ID students as well as 40% and 46% of ID teachers in MS1 and MS2 respectively considered that the IT infrastructure in schools as sufficient or very sufficient in meeting their learning or teaching needs, with mean ratings of 3.51-3.83 (SD:0.69-1.02) and 3.26-3.37 (SD:0.67-0.72). As for the needs of therapy or training, 9% (n=1) and 44% (n=4) of SPH, 67% (n=4) and 29% (n=2) of PHY in MS1 and MS2 respectively as well as 55% (n=6) of OC therapists in MS2 considered the IT infrastructure in their schools as sufficient or very sufficient to meet their therapy or training needs, with mean ratings of 2.91-3.56 (SD:0.54-0.73), 3.00-3.33 (SD: 0.82-1.03) and 2.43-3.55 (SD:0.52-0.53).

Teachers perceived the advanced IT facilities as quite sufficient (一般) to promote innovative teaching pedagogy, except ID teachers in MS2 who perceived a higher level of sufficiency in this aspect

When teachers were asked about the sufficiency of advanced IT facilities such as wireless network system in promoting innovative teaching pedagogy, 30% of NC and 34% of ID teachers in MS1 considered them as sufficient or very sufficient whereas 29% of NC and 14% of ID teachers considered them as insufficient or totally insufficient, with mean ratings of 2.90 (SD:0.99) and 3.19 (SD:0.69) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted for NC teachers in MS2. 44% of ID teachers considered them as sufficient in MS2 (Table 8.98, [E5]TQ7d). As for the therapists' needs, 27% and 33% of SPH (n=3), 33% and 29% of PHY (n=2) as well as 14%(n=1) and 27% (n=3) of OC therapists in MS1 and MS2 respectively considered IT facilities such as wireless network system in their schools to be sufficient to meet their therapy or training needs, with a mean ratings of 3.00-3.44 (SD:0.73-0.89), 3.00 (SD: 0.82-0.89) and 2.57-3.27 (SD:0.47-0.79) (Table 8.98, [E8]THQ6d).

Table 8.98 Teachers'/Therapists and students' perception of the sufficiency of IT infrastructure meet their needs and the IT facilities in schools to promote innovative teaching pedagogy ([E5]TQ7c,d, [E6-1/E6-2/E6-3]SQ7b, [E6-4/E6-5 /E6-6]SQ8b, [E8]THQ6c,d)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) choosing the option										*P*-value
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
Levels of sufficiency of IT infrastructure (e.g. upgraded computer model and computer operating system) meet learning/teaching/ therapy needs															
NC Students	MS1	3.34	0.99	80	5	(6)	36	(45)	26	(33)	7	(9)	6	(8)	0.084
	MS2	3.55	0.93	159	26	(16)	55	(35)	63	(40)	11	(7)	4	(3)	
ID Students	MS1	3.51	1.02	129	16	(12)	57	(44)	42	(33)	3	(2)	11	(8)	---
	MS2	3.83	0.69	60	7	(12)	38	(63)	14	(23)	0	(0)	1	(2)	
NC Teachers	MS1	2.97	0.90	103	2	(2)	27	(26)	47	(46)	20	(19)	7	(7)	0.837
	MS2	3.01	0.88	137	3	(2)	38	(28)	59	(43)	31	(23)	6	(4)	
ID Teachers	MS1	3.26	0.72	88	0	(0)	35	(40)	43	(49)	8	(9)	2	(2)	---
	MS2	3.37	0.67	59	0	(0)	27	(46)	28	(47)	3	(5)	1	(2)	
SPH	MS1	2.91	0.54	11	0	(0)	1	(9)	8	(73)	2	(18)	0	(0)	---
	MS2	3.56	0.73	9	1	(11)	3	(33)	5	(56)	0	(0)	0	(0)	
PHY	MS1	3.33	1.03	6	0	(0)	4	(67)	0	(0)	2	(33)	0	(0)	---
	MS2	3.00	0.82	7	0	(0)	2	(29)	3	(43)	2	(29)	0	(0)	
OC	MS1	2.43	0.53	7	0	(0)	0	(0)	3	(43)	4	(57)	0	(0)	---
	MS2	3.55	0.52	11	0	(0)	6	(55)	5	(45)	0	(0)	0	(0)	
Levels of sufficiency of IT facilities (e.g. wireless network system) in schools to promote innovative teaching pedagogy															
NC Teachers	MS1	2.90	0.99	103	1	(1)	30	(29)	42	(41)	18	(17)	12	(12)	0.121
	MS2	3.11	0.90	137	2	(1)	49	(36)	56	(41)	22	(16)	8	(6)	
ID Teachers	MS1	3.19	0.69	88	0	(0)	30	(34)	46	(52)	11	(13)	1	(1)	---
	MS2	3.34	0.66	59	0	(0)	26	(44)	27	(46)	6	(10)	0	(0)	
Levels of sufficiency of IT facilities (e.g. wireless network system) in schools to meet therapy/training needs															
SPH	MS1	3.00	0.89	11	0	(0)	3	(27)	6	(55)	1	(9)	1	(9)	---
	MS2	3.44	0.73	9	1	(11)	2	(22)	6	(67)	0	(0)	0	(0)	
PHY	MS1	3.00	0.89	6	0	(0)	2	(33)	2	(33)	2	(33)	0	(0)	---
	MS2	3.00	0.82	7	0	(0)	2	(29)	3	(43)	2	(29)	0	(0)	
OC	MS1	2.57	0.79	7	0	(0)	1	(14)	2	(29)	4	(57)	0	(0)	---
	MS2	3.27	0.47	11	0	(0)	3	(27)	8	(73)	0	(0)	0	(0)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in special schools as indicated by school heads in MS1 were: computers and projectors in classrooms, e-learning platforms as well as assistive devices

School heads were also asked to indicate the three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in schools. The three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd in schools as reported by the school heads were: "computers and projectors in classroom" (62%), "e-learning platform" (48%) and "assistive devices" (35%). They were followed by "wireless network" (31%), "multi-media computer rooms" (27%), "Mobile learning devices" (25%), "School campus digital TV" (21%) and digital tools (19%). The two least needed IT facilities or services were "video conferencing devices" (8%) and "e-mail" (2%). No statistically significant difference was found in this aspect in MS2 (Table 8.99, [E2-1/E1-2]HQ7).

The three most needed additional IT facilities or services which should be prioritized for teachers'/therapists' and students' use as indicated by school heads were: e-learning platforms, computers and projectors in classrooms as well as mobile learning devices

In MS1, the school heads indicated that the top three priorities for additional IT facilities or services which were needed for students and teachers were "e-learning platform" (50%), "computers and projectors in classroom" (48%) and "mobile learning devices" (38%). These were followed by "school campus digital TV" (32%), "assistive devices" (30%) and "wireless network" (29%). No statistically significant difference was found in this aspect in MS2 (Table 8.99, [E2-1/E2-2]HQ8).

Table 8.99 Facilities/services which were mostly needed and should be upgraded to provide an environment conducive to ITEd in schools ([E2-1/E2-2]HQ7) and additional facilities/services which schools wished to be prioritized for teachers'/therapists' and students' use ([E2-1/E2-2]HQ8).

IT facilities/services	Percentage (%)					
	Mostly needed upgraded facilities/services			Prioritized additional facilities/services		
	MS1 (N=52)	MS2 (N=52)	*P*-value	MS1 (N=56)	MS2 (N=52)	*P*-value
Computers and projectors in classroom	62	54	0.429	48	38	0.309
E-learning platform[#]	48	54	0.558	50	42	0.425
Assistive devices	35	29	0.529	30	33	0.795
Wireless network	31	19	0.176	29	19	0.259
Multi-media computer rooms	27	33	0.522	18	25	0.367
Mobile learning devices [e.g. Personal Digital Assistant (PDA), Pocket Personal Computer (PC)]	25	29	0.660	38	46	0.364
School campus digital TV	21	13	0.302	32	25	0.414
Digital tools (e.g. digital cameras)	19	19	1.000	18	17	0.941
Interactive electronic whiteboard	12	17	0.405	20	35	0.081
Broadband internet connection	10	15	0.376	4	6	0.589
Video conferencing devices	8	10	0.729	11	10	0.851
E-mail	2	2	1.000	2	0	0.335
Others (Please specify):	2	6	0.310	2	4	0.517

Three option selections; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

8.6 Providing Continuous Research and Development

The sixth strategic goal of the Second ITEd Strategy is "Providing continuous research and development". This strategy aims at doing research on the effectiveness of the ITEd strategy and the impact of IT on students' learning outcome as well as pioneering leading edge IT applications in pedagogy, education resources, school practices, curriculum integration and systems development.

School heads tended to be satisfied with their schools actively taking part in pilot projects or schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching

Table 8.100 ([E1-1/E1-2]HSQ8a-c) shows that 17% to 37% of school heads were satisfied or very satisfied with the three listed outcomes regarding the continuous research and development in ITEd in MS1. 37% of school heads were satisfied or very satisfied that their schools actively took part in pilot projects or pilot schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching. 37% of them were satisfied or very satisfied that their schools actively studied or evaluated the effectiveness of some innovative IT pedagogical strategies and shared the experience with the education community. Regarding the research-based projects, 17% of them were satisfied or very satisfied that the EMB could share the results of these projects with schools in order to assist them in the promotion of ITEd. All mean values fell in the range of 2.91 to 3.26 (SD:0.68-0.73) on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied'. No statistically significant difference was noted in MS2.

27% of special schools had launched pilot schemes or projects on the use of IT for teaching

The EMB has encouraged innovative use of IT in education and has initiated some pilot schemes in special schools in collaboration with the organisations or institutions in the community. The extent of participation of schools in such ITEd innovation projects revealed the levels of achievement in this aspect. 27% of schools had launched pilot schemes or projects on the use of IT for teaching in the school year of 2004/05 in MS1. 64% of them had launched similar pilot schemes or projects with other organisations. Of these, 56% of schools collaborated with local tertiary institutions, 33% with the EMB, 33% with local primary, secondary and special schools. 22% of schools collaborated with local community or commercial organisations. No statistically significant difference was noted for the above items in MS2 (Table 8.101, [E2-1/E2-2]HQ16a-c).

Table 8.100 School heads' levels of satisfaction with continuous research and development in ITEd ([E1-1/E1-2]HSQ8a-c)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							Mean (1-5)	SD	N	Count (%) of School Heads choosing the option							
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied	
a.	3.26	0.73	54	1	(2)	19	(35)	28	(52)	5 (9)	1 (2)	3.40	0.82	52	3	(6)	23	(44)	18	(35)	8 (15)	0 (0)	0.321
b.	3.26	0.73	54	1	(2)	19	(35)	28	(52)	5 (9)	1 (2)	3.27	0.87	52	2	(4)	21	(40)	19	(37)	9 (17)	1 (2)	0.846
c.	2.91	0.68	54	0	(0)	9	(17)	32	(59)	12 (22)	1 (2)	3.06	0.73	52	0	(0)	14	(27)	28	(54)	9 (17)	1 (2)	0.245

Aspects related to continuous research and development in ITEd

a. The school actively takes part in pilot projects or pilot schemes on teaching to explore the effectiveness of the innovative use of IT for the enhancement of learning and teaching.

b. The school actively studies or evaluates the effectiveness of some innovative IT pedagogical strategies and to share the experience with the education community.

c. The Education and Manpower Bureau can share the results of research-based projects (e.g. electronic school bag and interactive white board) with schools to assist schools in the promotion of ITEd.

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.101 School heads' reported on the pilot schemes on the use of IT for teaching in their schools in the 2004/05 and 2005/06 school years ([S2]HQ16a-c)

Pilot schemes	Percentage (%)		*P*-value
	MS1 (N=51)	MS2 (N=49)	
YES	27	45	0.071
NO	73	55	
Collaboration with other organisations	**(N=14)**	**(N=22)**	
YES	64	41	0.253 [c.]
NO	36	59	
Organisations	**(N=9)**	**(N=9)**	
Local tertiary institutions	56	44	0.730 [c.]
Education and Manpower Bureau	33	44	0.730 [c.]
Local primary, secondary, and special schools	33	56	0.436 [c.]
Local community/commercial organisations	22	33	0.730 [c.]
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	0	0	1.000 [c.]
Oversea schools/community organisations/commercial organisations/tertiary institutions	0	0	1.000 [c.]

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001. [c.] Mann-Whitney U Test (1-tailed Sig.)

Teachers expressed a neutral(一般) attitude towards the usefulness of the EMB support or resources, such as sharing the results of research-based projects with schools, in developing their ability in using IT for teaching

The EMB provided various support and resources in sharing the results of research-based projects, such as electronic school bag and interactive electronic whiteboard, with schools. In MS1, about one-fifth of the teachers (19% of NC and 20% of ID) agreed that the EMB support or resources were useful in developing their ability in using IT for teaching, with mean ratings of 3.01 (SD:0.65) and 3.07 (SD:0.59) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree'. No statistically significant difference was noted for NC teachers in MS2. 19% of ID teachers agreed to this statement in MS2 (Table 8.102, [E5]TQ19e).

Table 8.102 Teachers' levels of agreement on the usefulness of the support/resources provided by the Education and Manpower Bureau to develop teachers' ability in using IT ([E5]TQ19e)

Special school types		Mean (1-5)	SD	N	Count (%) of Teachers choosing the option										*P*-value
					Strongly agree		Agree		Neutral (一般)		Disagree		Strongly disagree		
Levels of agreement of the usefulness on the support/resources by Education and Manpower Bureau [e.g. sharing the results of research-based projects (e.g. electronic school bag and interactive electronic whiteboard) with schools] to develop teachers' ability in using IT for teaching															
NC	MS1	3.01	0.65	102	0	(0)	19	(19)	68	(67)	12	(12)	3	(3)	0.863
	MS2	3.00	0.67	132	0	(0)	26	(20)	83	(63)	20	(15)	3	(2)	
ID	MS1	3.07	0.59	87	0	(0)	17	(20)	60	(69)	9	(10)	1	(1)	---
	MS2	3.09	0.54	58	0	(0)	11	(19)	41	(71)	6	(10)	0	(0)	

Mean: 1= "Strongly disagree" and 5="Strongly agree"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers had some participation in exploring new technology as well as researching and evaluating the effectiveness of ITEd in schools

31% and 45% of the ITEd team teachers in MS1 and MS2 respectively perceived that they had considerable or strong participation in exploring new technology such as wireless system and developing innovative teaching methods when implementing school ITEd plans whereas 18% and 26% of them respectively perceived that they had little or no participation at all. The mean ratings for MS1 and MS2 were 3.15 (SD:0.92) and 3.29 (SD:0.97) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation' (Table 8.103, [E4-1/E4-2]ITQ3j). 36% and 48% of them in MS1 and MS2 respectively perceived that they had considerable or strong participation in performing research and evaluation on the effectiveness of ITEd in school whereas 31% and 23% respectively perceived that they had little or no participation in doing so, with mean ratings of 3.05 (SD:1.06) and 3.23 (SD:1.09) on a scale of 1 to 5 where 1 was 'none' and 5 was 'strong participation' (Table 8.103, [E4-1/E4-2]ITQ3k).

Table 8.103 ITEd Team teachers' perception of their participation in different tasks when implementing school ITEd plan ([E4-1/E4-2]ITQ3j,k)

	Mean (1-5)	SD	N	Count (%) of ITEd Team Teachers choosing the option									
				Strong participation		Considerable participation		Some participation (一般)		Little participation		None	
"To explore new technology (e.g. wireless network system) and develop innovative teaching methods."													
MS1	3.15	0.92	40	3	(8)	9	(23)	21	(53)	5	(13)	2	(5)
MS2	3.29	0.97	31	3	(10)	11	(35)	9	(29)	8	(26)	0	(0)
"To research and evaluate on the effectiveness of ITEd in school"													
MS1	3.05	1.06	40	3	(8)	11	(28)	14	(35)	9	(23)	3	(8)
MS2	3.23	1.09	31	2	(6)	13	(42)	9	(29)	4	(13)	3	(10)

Mean: 1= 1= "None" and 5="Strong participation"

8.7 Promoting Community–wide Support and Community Building

The seventh strategic goal of the Second ITEd Strategy is "Promoting community-wide support and community building". This strategy aims to enhance home-school co-operation and community-school collaboration. Two key areas in home-school co-operation were studied. First of all, parents are encouraged to involve in ITEd with regard to motivating their children towards the appropriate use of IT and delivering home messages on cyber ethics. Secondly, schools are encouraged to enhance communication with parents through the use of IT. Community-school collaboration, such as school support from the IT industry, NGOs and community organisations, will contribute to ITEd in terms of trainings and providing digital resources and IT facilities. These collaborations will help to address the digital divide issue and will ultimately help the building of the community.

The sections below examine the following aspects:

- Home-school co-operation and parents' involvement
- Community-wide involvement
- Digital divide

8.7.1 Home-school Co-operation and Parents' Involvement

The extent of schools' initiatives in home-school co-operation, including measures to enhance communication between schools and parents as well as parents' involvement in the promotion of ITEd and their satisfaction with these collaboration activities or programmes, are discussed in this section.

8.7.1.1 Home-school Co-operation

School heads were quite satisfied (一般) with their schools setting up concrete programmes to encourage parents' involvement in ITEd

Regarding the concrete programmes that schools set up to encourage parents' involvement in and promotion of related work on ITEd, 30% of school heads in MS1 were satisfied or very satisfied with this aspect. No statistically significant difference was noted in this aspect in MS2 (Table 8.104, [E1-1/E-2]HSQ7a).

Table 8.104 School heads' levels of satisfaction with their schools setting up concrete programmes to encourage parents' involvement in and promotion of related work on ITEd ([E1-1/E1-2]HSQ7a)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school sets up concrete programme(s) to encourage parents' involvement in and promotion of related work on ITEd."									
MS1	3.19	0.65	54	0 (0)	16 (30)	33 (61)	4 (7)	1 (2)	0.141
MS2	3.40	0.75	52	3 (6)	20 (38)	24 (46)	5 (10)	0 (0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common measure in which schools or Parent-Teacher Associations carried out to encourage parents' participation in related work of ITEd in schools was encouraging parents to understand situations in schools through visiting school websites or intranets — a statistically significant increase was found in the percentage of schools encouraging parents to instill the proper principles, values and attitude in the use of IT into their children in MS2

School heads were asked about the attempts that their schools or the Parent-Teacher Associations in schools made in organising home-school collaboration activities or measures. In MS1, the three most common measures were encouraging parents to understand situations in schools through visiting school websites or intranets (91%), providing ITEd activities for parents (70%) and explaining the work of ITEd in schools to parents (52%). The percentage of schools that had taken the measures to encourage parents to instill the proper principles, values and attitude in the use of IT into their children significantly increased statistically from 50% in MS1 to 77% in MS2 (Table 8.105, [E2-1/E2-2]HQ13a-d).

Table 8.105 Activities/measures which schools/Parent-Teacher Associations organised/ carried out to encourage parents' participation in related work of ITEd in schools in the 2004/05 and 2005/06 school years ([E2-1/E2-2]HQ13a-d)

Measures taken to encourage parents' participation in related work of ITEd in school	Percentage (%)		*P*-value
	MS1 (N=56)	MS2 (N=52)	
a. Encouraged parents to visit the school website/intranet so as to understand the situation in school (e.g. IT in Education)	91	81	0.124
b. Provided ITEd activities for parents	70	81	0.184
c. Explained the work of ITEd in school to parents	52	48	0.701
d. Encouraged parents to instill the proper principles, values and attitude in the use of IT into their child/children	50	77	0.004**

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The most common activity participated by parents was basic computer operation course

With regard to the participation of parents in ITEd-related programmes or activities organised by schools in the 2004/05 school year, a low participation rate of 9% (n=3) and 17% (n=14) was reported for NC and ID parents respectively in MS1. 24% of both NC (n=20) and ID parents (n=17) participated in these programmes or activities in MS2 (Table 8.106, [E7-1/E7-2]PQ18). Of which, the most common activity participated by parents was "basic computer operation course" [NC parents=MS1: 100% (n=3), MS2: 50% (n=10); ID parents=MS1: 57% (n=8), MS2: 71% (n=12)]. A few indicated that they participated in "talks on teaching children in using IT properly" [NC parents=MS1: 33% (n=1), MS2: 25% (n=5); ID parents=MS1: 7% (n=1), MS2: 41% (n=7)], "Internet information course" [NC parents=MS1: 0%, MS2: 10% (n=2); ID parents=MS1: 14% (n=2), MS2: 18% (n=3)] and "Parent-Child IT learning workshop [NC parents=MS1: 0%, MS2: 5% (n=1); ID parents=MS1: 7% (n=1), MS2: 18% (n=3)] (Table 8.106, [E7-1/E7-2]PQ19). These figures must be interpreted with caution due to the small sample size.

Table 8.106 Parents' participation in ITEd programmes/activities organised by schools in the 2004/05 and 2005/06 school years ([E7-1/7-2]PQ18,19)

Parents' participation in ITEd programme/activity	Percentage (%)		Percentage (%)	
	NC		ID	
	MS1 (N=34)	MS2 (N=85)	MS1 (N=81)	MS2 (N=70)
YES	9	24	17	24
NO	91	76	83	76
Modes of IT in Education programmes/activities	**(N=3)**	**(N=20)**	**(N=14)**	**(N=17)**
Basic computer operation course	100	50	57	71
Internet information course	0	10	14	18
Talks on teaching children in learning IT	0	25	0	18
Talks on teaching children in using IT properly	33	25	7	41
Parent-Child IT learning workshop	0	5	7	18
Others	0	25	50	24

Multiple responses items

Parents perceived that ITEd programmes or activities organised by schools for parents were quite sufficient (一般), except NC parents in MS1 who perceived a higher level of sufficiency in this aspect

When parents were asked about the adequacy of ITEd programmes or activities organised by schools for parents, 33% (n=1) and 20% (n=4) of NC as well as 21% (n=3) and 12% (n=2) of ID parents in MS1 and MS2 respectively considered that they were sufficient or very sufficient whereas 15% (n=3) of NC parents in MS2 as well as 21% (n=3) and 30% (n=5) of ID parents in MS1 and MS2 respectively considered them as insufficient or totally insufficient. The mean ratings of this item for NC and ID parents were 3.00-3.33 (SD:0.58-0.73) and 2.76-3.00 (SD:0.75-1.18) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 8.107, [E7-1/E7-2]PQ21). These figures must be interpreted with caution due to the small sample size.

Parents agreed that ITEd programmes or activities could enhance parent-child relationship, except ID parents in MS1 who perceived a lower level of agreement to this aspect

With respect to the effectiveness of ITEd programmes or activities, parents indicated a positive attitude towards the outcomes derived from these activities. Parents agreed or strongly agreed that the following outcomes were derived from these programmes or activities: enhanced parent-child relationship [NC parents=MS1: 100% (n=3), MS2: 65% (n=13); ID parents= MS1: 50% (n=7), MS2: 76% (n=13)], their understanding of the ITEd policy in their children's schools [NC parents=MS1: 67% (n=2), MS2: 55% (n=11); ID parents=MS1: 79% (n=11), MS2: 35% (n=6)], enhanced their IT proficiency [NC parents=MS1: 33% (n=1), MS2: 50% (n=10); ID parents=MS1: 71% (n=10), MS2: 59% (n=10)] and increased their interest in IT [NC parents=MS1: 33% (N=1), MS2: 45% (n=9); ID parents=MS1: 78% (n=11), 41% (n=7)] (Table 8.107, [E7-1/E7-2]PQ22a-d). These figures must be interpreted with caution due to the small sample size.

Parents were generally willing to participate in ITEd programmes/activities

When parents were asked to show their willingness to participate in ITEd programmes or activities in the future, 50% and 37% of NC parents as well as 37% and 39 of ID parents in MS1 and MS2 respectively indicated they were willing or very willing to participate in these activities in the future whereas 6% and 22% of NC as well as 16% and 15% of ID parents in MS1 and MS2 respectively indicated that they were not very willing or totally not willing to do so. The mean ratings for NC and ID parents were 3.16-3.58 (SD:0.82-0.91) and 3.20-3.28 (SD:0.76-0.78) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. (Table 8.107, [E7-1/E7-2]PQ23).

Table 8.107 Parents' perception of the levels of sufficiency, agreement of the outcomes and willingness to participate in ITEd programmes/activities organised by the schools ([E7-1/E7-2]PQ21,22a-d,23)

Special school types	MS1 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient	MS2 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Very sufficient	Sufficient	Quite sufficient (一般)	Insufficient	Totally Insufficient
Levels of sufficiency of ITEd programmes/activities for parents																
NC	3.33	0.58	3	0 (0)	1 (33)	2 (67)	0 (0)	0 (0)	3.00	0.73	20	0 (0)	4 (20)	13 (65)	2 (10)	1 (5)
ID	3.00	1.18	14	2 (14)	1 (7)	8 (57)	1 (7)	2 (14)	2.76	0.75	17	0 (0)	2 (12)	10 (59)	4 (24)	1 (6)
(Mean: 1="Totally insufficient" and 5="Very sufficient")																

Special school types	Outcomes	MS1 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree	MS2 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Strongly agree	Agree	Neutral	Disagree	Strongly disagree
NC	a.	3.67	0.58	3	0 (0)	2 (67)	1 (33)	0 (0)	0 (0)	3.45	0.89	20	1 (5)	10 (50)	7 (35)	1 (5)	1 (5)
	b.	3.33	0.58	3	0 (0)	1 (33)	2 (67)	0 (0)	0 (0)	3.40	0.88	20	2 (10)	7 (35)	8 (40)	3 (15)	0 (0)
	c.	3.33	0.58	3	0 (0)	1 (33)	2 (67)	0 (0)	0 (0)	3.50	0.95	20	3 (15)	7 (35)	7 (35)	3 (15)	0 (0)
	d.	4.00	0.00	3	0 (0)	3 (100)	0 (0)	0 (0)	0 (0)	3.75	0.79	20	3 (15)	10 (50)	6 (30)	1 (5)	0 (0)
ID	a.	3.64	0.84	14	0 (0)	11 (79)	2 (14)	0 (0)	1 (7)	3.35	0.70	17	1 (6)	5 (29)	10 (59)	1 (6)	0 (0)
	b.	3.79	0.97	14	2 (14)	9 (64)	2 (14)	0 (0)	1 (7)	3.29	0.69	17	0 (0)	7 (41)	8 (47)	2 (12)	0 (0)
	c.	3.64	0.93	14	1 (7)	9 (64)	3 (21)	0 (0)	1 (7)	3.53	0.62	17	0 (0)	10 (59)	6 (35)	1 (6)	0 (0)
	d.	3.07	1.14	14	0 (0)	7 (50)	3 (21)	2 (14)	2 (14)	3.76	0.44	17	0 (0)	13 (76)	4 (24)	0 (0)	0 (0)
(Mean: 1="Strongly disagree" and 5="Strongly agree")																	

Special school types	MS1 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	MS2 Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing
Levels of willingness to participate in ITEd programmes/activities to be organised in schools																
NC	3.58	0.91	36	6 (17)	12 (33)	16 (44)	1 (3)	1 (3)	3.16	0.82	86	2 (2)	30 (35)	35 (41)	18 (21)	1 (1)
ID	3.20	0.78	81	1 (1)	29 (36)	38 (47)	11 (14)	2 (2)	3.28	0.76	75	3 (4)	26 (35)	35 (47)	11 (15)	0 (0)
(Mean: 1="Totally not willing" and 5="Very willing")																

Outcomes derived from ITEd programmes/activities

a. Enhance your understanding of the ITEd policy in your child's school

b. Increase your interest in IT

c. Enhance your IT proficiency

d. Enhance parent-child relationship

8.7.1.2 Parents' Use of IT as a Communication Tool

The use of e-learning platform as a communication tool amongst parents, teachers and schools was not common

Regarding the use of e-learning platforms as a tool for communication, 24% and 38% of NC as well as 35% and 39% of ID parents in MS1 and MS2 respectively reported having heard about the platforms. Among the parents who had heard about e-learning platforms, 13% (n=1) and 3% (n=1) of NC parents as well as 7% (n=2) and 10% (n=3) of ID parents in MS1 and MS2 respectively frequently or very frequently visited the platforms whereas 38% (n=3) and 69% (n=23) of NC as well as 37% (n=11) and 30% (n=9) of ID parents respectively rarely or never visited the platforms. The mean ratings for NC and ID parents were 2.00-2.75 (SD:0.87-1.16) and 2.53-2.77 (SD:0.86-0.94) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 8.108, [E7-1/E7-2]PQ9a,b).

Regarding the effective use of e-learning platforms by schools for communication purpose among parents, schools and teachers, 51% (n=4) and 30% (n=10) of NC as well as 34% (n=10) and 33% (n=10) of ID parents in MS1 and MS2 respectively agreed or strongly agreed that it was effective. The mean ratings for NC and ID parents were 3.18-3.63 (SD:0.68-0.74) and 3.23-3.33 (SD:0.63-0.71) respectively on a scale of 1 to 5 where 1 was 'strongly disagree' and 5 was 'strongly agree' (Table 8.108, [E7-1/E7-2]PQ9e).

Table 8.108 Parents' levels of frequency in visiting e-learning platforms and their levels of agreement to schools' effective use of the platforms to promote communication amongst parents, schools and teachers ([E7-1/E7-2]PQ9a,b,e)

Whether parents had heard about the e-learning platform provided by the schools	Percentage (%) NC		Percentage (%) ID	
	MS1 (N=34)	MS2 (N=88)	MS1 (N=85)	MS2 (N=76)
Yes	24	38	35	39
No	76	63	65	61

Special school types		Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Very Frequently	Frequently	Occasionally (間中)	Rarely	Never
Levels of frequency that parents visited the e-learning platforms (Mean: 1="Never" and 5="Very frequently")									
NC	MS1	2.75	1.16	8	1 (13)	0 (0)	4 (50)	2 (25)	1 (13)
	MS2	2.00	0.87	33	0 (0)	1 (3)	9 (27)	12 (36)	11 (33)
ID	MS1	2.53	0.86	30	0 (0)	2 (7)	17 (57)	6 (20)	5 (17)
	MS2	2.77	0.94	30	2 (7)	1 (3)	18 (60)	6 (20)	3 (10)

Special school types		Mean (1-5)	SD	N	Count (%) of Parents choosing the option: Strongly agree	Agree	Neutral (一般)	Disagree	Strongly disagree
Levels of agreement that the school could effectively use the e-learning platform to promote their communication with the school and teachers (Mean: 1="Strongly disagree" and 5="Strongly agree")									
NC	MS1	3.63	0.74	8	1 (13)	3 (38)	4 (50)	0 (0)	0 (0)
	MS2	3.18	0.68	33	0 (0)	10 (30)	20 (61)	2 (6)	1 (3)
ID	MS1	3.33	0.71	30	2 (7)	8 (27)	18 (60)	2 (7)	0 (0)
	MS2	3.23	0.63	30	0 (0)	10 (33)	17 (57)	3 (10)	0 (0)

Similar to the perception of parents, a small proportion of the teachers showed positive attitude towards the use of e-learning platforms to communicate with parents. 35% of NC teachers in both MS1 and MS2 as well as 48% and 44% of ID teachers in MS1 and MS2 respectively expressed that they were willing or very willing to make use of the platforms to communicate with parents. The mean ratings for NC and ID teachers were 3.15-3.16 (SD:0.77-0.78) and 3.37-3.40 (SD:0.62-0.72)

respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing'. No statistically significant difference was noted in this aspect for NC teachers. (Table 8.109, [E5]TQ11e). When looking at the practice of teachers in this regard, an extremely small proportion of 2% and 4% of NC as well as 3% and 2% of ID teachers in MS1 and MS2 respectively reported that they frequently or very frequently used e-learning platforms to communicate with parents. 93% and 85% of NC as well as 76% and 84% of ID teachers in MS1 and MS2 respectively expressed that they rarely or never used the platforms for this purpose. The mean ratings for NC and ID teachers were 1.37-1.57 (SD:0.72-0.84) and 1.61-1.79 (SD:0.86-0.89) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 8.109, [E5]TQ11f).

Table 8.109 Teachers' levels of willingness and frequency in the use of e-learning platforms to communicate with parents [E5]TQ11e,f)

Special school types		Mean (1-5)	SD	N	Count (%) of Teachers choosing the option					*P*-value
					Very willing	Willing	Maybe (一般)	Not very willing (不願意)	Totally not willing	
Levels of willingness of teachers making use of the e-learning platform to communicate with parents (Mean: 1="Totally not willing" and 5="Very willing")										
NC	MS1	3.15	0.77	100	1 (1)	34 (34)	45 (45)	19 (19)	1 (1)	0.915
	MS2	3.16	0.78	130	2 (2)	43 (33)	61 (47)	22 (17)	2 (2)	
ID	MS1	3.37	0.72	87	0 (0)	42 (48)	37 (43)	6 (7)	2 (2)	---
	MS2	3.40	0.62	57	1 (2)	24 (42)	29 (51)	3 (5)	0 (0)	
Special school types		**Mean (1-5)**	**SD**	**N**	**Count (%) of Teachers choosing the option**					***P*-value**
					Very Frequently	**Frequently**	**Occasionally (間中)**	**Rarely**	**Never**	
Levels of frequency that teachers used the e-learning platform to communicate with parents (Mean: 1="Never" and 5="Very frequently")										
NC	MS1	1.37	0.72	100	1 (1)	1 (1)	5 (5)	20 (20)	73 (73)	0.046*
	MS2	1.57	0.84	127	0 (0)	5 (4)	14 (11)	30 (24)	78 (61)	
ID	MS1	1.79	0.89	87	0 (0)	3 (3)	18 (21)	24 (28)	42 (48)	---
	MS2	1.61	0.86	57	1 (2)	0 (0)	8 (14)	15 (26)	33 (58)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.7.1.3 Roles of Parents to Ensure Students' Understanding of Ethical, Legal and Health Issues Involved in Using IT

Parents were generally concerned about ethical, legal and health issues in relation to students' use of IT

The EMB has encouraged schools and the Parent-Teacher Associations to hold activities related to cyber ethics for parents. As stated in 8.7.1.1, half of schools or Parent-Teacher Associations (MS1: 50%; MS2: 77%) carried out activities or measures to encourage parents to instill proper principles, values and attitude in the use of IT into their children (Table 8.105, [E2-1/E2-2]HQ13d). 33% (n=1) and 25% (n=5) of NC parents as well as 7% (n=1) and 41% (n=7) of ID parents in MS1 and MS2 respectively participated in the talks on teaching children to use IT properly (Table 8.106, [E7-1/E7-2]option 4 of PQ19). Most of the parents showed their concerns about the ethical, legal and health issues involved in using IT. Table 8.110 ([E7-1/E7-2]PQ15) showed a list of such concerns in which the top three concerns were "avoid spending long hours on computer or online games" (NC parents=MS1: 76%, MS2: 85%; ID parents=MS1=MS2: 79%), "do not disclose personal particulars to strangers" (NC parents=MS1: 66%, MS2: 68%; ID parents=MS1: 58%, MS2: 62%) and "do not visit pornographic websites" (NC parents=MS1: 63%, MS2: 75%; ID parents=MS1: 67%, MS2: 63%). Other options such as "beware of e-mail bombs or the spread of computer virus" (NC parents=MS1: 55%, MS2: 61%; ID parents=MS1: 44%, MS2: 62%), "do not use pirated (illegal) software" (NC parents=MS1: 55%, MS2: 64%; ID parents=MS1: 47%, MS2: 62%) and "do not send or forward of

unnecessary e-mail or messages" (NC parents=MS1: 39%, MS2: 60%; ID parents=MS1: 36%, MS2: 59%) were also important issues concerned by the parents.

Table 8.110 Parents' concerns about ethical, legal and health issues in relation to students' use of IT ([E7-1/E7-2]PQ15)

Social and ethical issues in relation to students' use of IT	Percentage (%) NC		Percentage (%) ID	
	MS1 (N=38)	MS2 (N=88)	MS1 (N=90)	MS2 (N=76)
Avoid spending long hours on computer/online games	76	85	79	79
Do not disclose personal particulars to strangers	66	68	58	62
Do not visit pornographic websites	63	75	67	63
Do not use pirated (illegal) software	55	64	47	62
Beware of E-mail bombs or the spread of computer virus	55	61	44	62
Do not send/forward unnecessary E-mail/messages	39	60	36	59

Multiple responses items

8.7.1.4 Parents as Supporters and Motivators for Students' Learning with IT

"To provide IT facilities at home" and "to set a good example by learning in a new era through learning about IT" were the two most important types of parental support perceived by school heads

When school heads were asked to rate the level of importance against parental support for students' learning with IT (Table 8.111, [E2-1/E2-2]HQ12a-g), as reported in MS1, provision of IT facilities at home (rated as important or very important by 97%), understanding of children's learning situation through the visit of the intranet or school homepage (rated as important or very important by 94%) and setting a good example by learning in a new era through learning about IT (rated as important or very important by 93%) were the three most important options rated by school heads. These were followed by providing assistive devices (85%) and the understanding of children's learning situation through the visit of the school e-learning platform (84%). Choosing suitable digital resources for the children (79%) and monitoring children's use of the Internet and assisting them to develop the right online learning attitude (72%) were considered as the two least important types of parental support among the listed items by school heads, but the perception was still positive. These findings showed that school heads expressed high expectations on parental support for the implementation of ITEd. The mean ratings of all items fell in the range of 3.88 to 4.55 (SD:0.57-1.00) on a scale of 1 to 5 where 1 was 'totally not important' and 5 was 'very important'. A statistically significant decrease was noted in school heads' perceived level of importance in the parental support of providing IT facilities at home" (from 97% to 88%) in MS2 (Table 8.110, [E2-1/E2-2]HQ12a-f).

Most students had computers and broadband Internet access at home

As indicated by school heads, provision of IT facilities at home was one of the most important type of parental support for students' learning with IT after school. When parents and students were asked about the home ownership of computers, 83% and 93% of NC as well 92% and 88% of ID parents in MS1 and MS2 respectively reported that they had computers at home (Table 8.112, [E7-1/E7-2]PQ11). 91% and 87% of NC as well as 68% and 55% of ID students in MS1 and MS2 respectively reported that they had computers at home (Table 8.111, [E6-2/E6-3]SQ8a, [E6-4/E6-5/E6-6]SQ9a). Regarding connectivity to the Internet, around 80% of the parents (84% of NC and 89% of ID) and students (81% of both NC and of ID) reported that they could access the Internet at home with all NC and 90% of ID families using broadband connection in MS1 (Table 8.111, [E7-1/E7-2]PQ12a,b, [E6-2/E6-3]SQ8c, [E6-4/E6-5/E6-6]SQ9c). In MS2, around 90% of NC parents and students (NC parents=91%, NC students=90%) as well as around 80% of ID parents and students (ID parents= 85%, ID students= 82%) reported that they could access the Internet at home with 90% of NC and 83% of

ID families using broadband connection. A statistically significant increase was noted in the percentage of NC students having Internet access at home (from 81% to 90%) in MS2. This broad picture indicated that computers were quite widely available at home for special school students.

Table 8.111 School heads' perception of the importance of parental support/encouragement to students' use of IT in learning ([E2-1/E2-2]HQ12a-g)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very important		Important		Quite important (一般)		Not important				Very important		Important		Quite important (一般)		Not important	
a.	4.55	0.57	58	34	(59)	22	(38)	2	(3)	0 (0)	4.23	0.81	52	21	(40)	25	(48)	3	(6)	3 (6)	0.032*
b.	4.09	0.68	58	15	(26)	34	(59)	8	(14)	1 (2)	3.98	0.78	52	11	(21)	32	(62)	7	(13)	1 (2)	0.562
c.	3.88	0.59	58	6	(10)	40	(69)	11	(19)	1 (2)	3.71	0.75	52	4	(8)	34	(65)	9	(17)	5 (10)	0.316
d.	3.90	1.00	58	17	(29)	25	(43)	11	(19)	3 (5)	3.79	1.00	52	13	(25)	23	(44)	8	(15)	8 (15)	0.538
e.	4.10	0.74	58	17	(29)	32	(55)	7	(12)	2 (3)	4.04	0.79	52	14	(27)	29	(56)	6	(12)	3 (6)	0.719
f.	4.19	0.61	58	16	(28)	38	(66)	3	(5)	1 (2)	4.06	0.70	52	12	(23)	33	(63)	5	(10)	2 (4)	0.337
g.	4.34	0.66	58	25	(43)	29	(50)	3	(5)	1 (2)	4.25	0.62	52	18	(35)	29	(56)	5	(10)	0 (0)	0.347

Parental support/encouragement

a. To provide IT facilities at home

b. To provide assistive devices

c. To choose other suitable digital resources for their child (children) apart from those provided by teachers

d. To monitor their child's (children's) use of the Internet and assist them to develop the right online learning attitude

e. To visit the school e-learning platform[#] so as to understand their child's (children)'s learning situation

f. To visit the intranet/school homepage so as to understand their child's (children)'s learning situation

g. To set a good example by learning in a new era through learning about IT

Mean: 1="Totally not important" and 5="Very important"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

[#] E-learning platform is a learning system developed on the environment of the Internet/Intranet which provides various learning tools such as learning material/download, assignment submission, online tests and learning records etc.

Table 8.112 Students' home ownership of IT facilities ([E6-2/E6-3]SQ8a,c [E6-4/E6-5/E6-6]SQ9a,c, [E7-1/E7-2]PQ11,12a,b)

	Percentage (%)								
	NC Students			ID Students		NC Parents		ID Parents	
Having computers at home	**MS1 (N=70)**	**MS2 (N=143)**	***P*-value**	**MS1 (N=124)**	**MS2 (N=60)**	**MS1 (N=36)**	**MS2 (N=88)**	**MS1 (N=78)**	**MS2 (N=76)**
YES	91	87	0.164 [a]	68	55	83	93	92	88
NO	9	13		32	45	17	7	8	12
Having Internet access at home	**(N=64)**	**(N=124)**		**(N=86)**	**(N=33)**	**(N=25)**	**(N=80)**	**(N=66)**	**(N=61)**
YES	81	90	0.016*	81	82	84	91	89	85
NO	19	10		19	18	16	9	11	15
Type of Internet connection						**(N=21)**	**(N=73)**	**(N=59)**	**(N=52)**
Broadband	-	-		-	-	100	90	90	83
Dialup	-	-		-	-	0-	10	10	17

[a.] Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001; [b.] Chi-Square Test: *p<0.05; **p<0.01; ***p<0.001.

Students tended to perceive the IT facilities at home as sufficient and they tended to be satisfied with the speed of Internet connection at home, except ID student in MS2 who perceived a lower level of satisfaction with this aspect

Regarding the extent of opportunity for students to use computers at home, 43% and 44% of NC as well as 26% and 36% of ID parents in MS1 and in MS2 respectively reported that their children had opportunity to use computers frequently or very frequently at home. The mean ratings for NC and ID parents were 3.43-3.53 (SD:1.03-1.18) and 3.00-3.25 (SD:1.13-1.19) respectively on a scale of 1 to 5 where 1 was 'never' and 5 was 'very frequently' (Table 8.113, [E7-1/E7-2]PQ14). Regarding the students' perception of the adequacy of IT facilities at home, 56% and 65% of NC as well as 56% and 36% of ID students in MS1 and MS2 respectively considered that they were sufficient or very sufficient. The mean ratings for NC and ID students were 3.53-3.63 (SD:1.12-1.19) and 3.18-3.56 (SD:0.95-1.02) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient' (Table 8.113, [E6-2/E6-3]SQ8b, [E6-4/E6-5/E6-6]SQ9b). Similar percentages of the students (NC students=MS1: 56%, MS2: 62%; ID students=MS1: 59%, MS2: 30%) were satisfied or very satisfied with the speed of Internet connection at home. The mean ratings for NC and ID students were 3.50-3.73 (SD:0.95-1.16) and 3.19-3.62 (SD:0.62-0.94) respectively on a scale of 1 to 5 where 1 was 'totally not satisfied' and 5 was 'very satisfied' (Table 8.113, [E6-2/E6-3]SQ8d, [E6-4/E6-5/E6-6]SQ9d). No statistically significant difference was noted for NC students in these two aspects.

Table 8.113 Parents' perception of the opportunities for students to use computers at home ([E7-1/E7-2]PQ14) and students' perception of the sufficiency levels of IT facilities at home as well as their satisfaction levels with the speed of Internet connection at home [E6-2/E6-3]SQ8b,8d [E6-4/E6-5/E6-6]SQ9b,9d)

Special school types/ Stakeholders		Mean (1-5)	SD	N	Count (%) Parents choosing the option										*P*-value
					Very Frequently		Frequently		Occasionally (間中)		Rarely		Never		
Opportunity for students to use the computer(s) at home (Mean: 1="Never" and 5="Very frequently")															
NC Parents	MS1	3.43	1.03	28	5	(18)	7	(25)	12	(43)	3	(11)	1	(4)	---
	MS2	3.53	1.18	78	24	(31)	10	(13)	30	(38)	11	(14)	3	(4)	
ID Parents	MS1	3.00	1.19	70	13	(19)	5	(7)	26	(37)	21	(30)	5	(7)	---
	MS2	3.25	1.13	65	12	(18)	12	(18)	24	(37)	14	(22)	3	(5)	
		Mean (1-5)	**SD**	**N**	**Count (%) Students choosing the option**										***P*-value**
					Very sufficient		**Sufficient**		**Quite sufficient (一般)**		**Insufficient**		**Totally Insufficient**		
Levels of sufficiency of IT facilities at home (Mean: 1="Totally insufficient" and 5="Very sufficient")															
NC Students	MS1	3.53	1.19	64	16	(25)	20	(31)	13	(20)	12	(19)	3	(5)	0.751
	MS2	3.63	1.12	124	28	(23)	52	(42)	19	(15)	20	(16)	5	(4)	
ID Students	MS1	3.56	1.02	85	14	(17)	33	(39)	28	(34)	4	(5)	5	(6)	---
	MS2	3.18	0.95	33	3	(9)	9	(27)	12	(36)	9	(27)	0	(0)	
		Mean (1-5)	**SD**	**N**	**Count (%) Students choosing the option**										***P*-value**
					Very satisfied		**Satisfied**		**Quite satisfied (一般)**		**Not satisfied**		**Totally not satisfied**		
Levels of satisfaction with the speed of Internet connection at home (Mean: 1="Totally not satisfied" and 5="Very satisfied")															
NC Students	MS1	3.50	1.16	52	11	(21)	18	(35)	12	(23)	8	(15)	3	(6)	0.214
	MS2	3.73	0.95	112	25	(22)	45	(40)	30	(27)	11	(10)	1	(1)	
ID Students	MS1	3.62	0.94	69	11	(16)	30	(43)	23	(33)	3	(4)	3	(4)	---
	MS2	3.19	0.62	27	0	(0)	8	(30)	16	(59)	3	(11)	0	(0)	

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students perceived the assistive devices at home as quite sufficient (一般) except ID students in MS1 who perceived a higher level of sufficiency in this aspect. Parents indicated a lower level of sufficiency than students in this aspect

When students were asked about their needs to use assistive devices when using IT facilities at home, 43% and 58% of NC students as well as 48% and 67% of ID students in MS1 and MS2 respectively expressed their needs (Table 8.114a, [E6-1/E6-3]SQ8e, [E6-4/E6-5/E6-6]SQ9e). 53% and 41% of NC parents as well as 38% and 25% of ID parents in MS1 and MS2 respectively indicated that their children needed to use assistive devices when using IT facilities at home (Table 8.114a, [E7-1/E7-2]PQ13a).

Table 8.114a Percentages of parents and students reported that students needed assistive devices when using IT facilities at home ([E6-3]SQ8e, [E6-4/E6-5/E6-6]SQ9e, [E7-1/E7-2]PQ13a)

Stakeholders	Special school types	MS1			MS2			*P*-value
		Count	%	N	Count	%	N	
Students	H	-	(-)	-	-	(-)	-	
	SSD	-	(-)	-	-	(-)	-	
	VI	17	(71)	24	28	(88)	32	
	HI	0	(0)	9	9	(43)	21	
	ID-M	17	(47)	36	-	(-)	-	
	ID-Mmod	7	(27)	26	4	(27)	15	
	ID-Mod	15	(79)	19	18	(100)	18	
	ID-S	2	(50)	4	-	(-)	-	
	PD	0	(0)	8	9	(33)	27	
	NC	17	(43)	40	46	(58)	80	0.112
	ID	41	(48)	85	22	(67)	33	---
Parents	SSD	0	(0)	13	-	(-)	-	
	VI	8	(62)	13	21	(66)	32	
	HI	5	(83)	6	7	(33)	21	
	ID-M	10	(30)	33	-	(-)	-	
	ID-Mmod	13	(46)	28	9	(20)	46	
	ID-Mod	0	(0)	7	5	(33)	15	
	ID-S	4	(100)	4	3	(50)	6	
	PD	-	(-)	-	6	(21)	29	
	NC	16	(53)	30	34	(41)	82	---
	ID	27	(38)	72	17	(25)	67	---

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students were also asked about the adequacy of assistive devices at home to meet their needs. 35% and 31% of NC as well as 37% and 23% of ID students in MS1 and MS2 respectively regarded the assistive devices at home as sufficient or very sufficient. The mean ratings for NC and ID students were 2.80-3.00 (SD:0.94-1.28) and 2.50-3.38 (SD:0.86-1.04) respectively on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. No statistically significant difference was noted in MS2 for NC students in this aspect. Regarding the mean values of the sufficiency of assistive devices at home among students who need to use assistive devices when using IT facilities, the bottom two were those of ID-S and VI students in MS1 with same mean ratings of 3.00 (SD:0.00-0.94) as well as ID-Mod and VI students in MS2 with mean ratings of 2.17 (SD: 0.51) and 2.61 (SD:1.34) respectively (Table 8.114b, [E6-3]SQ8f, [E6-4/E6-5/E6-6]SQ9f). From the parents' point of view, they perceived a lower level of sufficiency in assistive devices at home in MS1. 26% and 24% of NC as well as 22% and 30% of ID parents in MS1 and MS2 respectively thought that the assistive devices were sufficient or very sufficient to meet their children's needs whereas 63% and 41% of NC as well as 41% and 35% of ID parents respectively considered the assistive devices as insufficient or totally

insufficient. The mean ratings for NC and ID parents were 2.50-2.74 (SD:0.39-1.37) and 2.78-3.00 (SD:0.85-1.12) respectively. With respect to the responses from the parents whose children needed to use assistive devices when using IT facilities in different special school types, VI parents perceived the lowest level of sufficiency in assistive devices at home with a mean rating of 2.13 (SD:1.25), followed by ID-M [2.50 (SD:0.85)], HI [2.60 (SD:1.14)], ID-Mmod [2.92 (SD:0.76)] and ID-S [3.00 (SD:1.15)] in MS1. In MS2, ID-S parents perceived the lowest level of sufficiency in assistive devices at home with a mean rating of 2.33 (SD:0.58), followed by VI students [2.48 (SD:1.03)] ([E7-1/E7-2]PQ13b).

Table 8.114b Parents' and students' perception of the sufficiency of assistive devices at home to meet students' needs ([E6-3]SQ8f, [E6-4 /E6-5/E6-6]SQ9f, [E7-1/E7-2]PQ13b)

Stake-holders	Special school types	MS1										MS2										*P*-value
		Mean (1-5)	SD	N	Count (%) of choosing the option							Mean (1-5)	SD	N	Count (%) of choosing the option							
					Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally Insufficient		
Students	H	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	-	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	SSD	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	-	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	VI	3.00	0.94	17	0	(0)	6	(35)	6	(35)	4	(24)	1	(6)	2.61	1.34	28	2	(7)	6	(21)	8	(29)	3	(11)	9	(32)	
	HI	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.22	0.97	9	1	(11)	2	(22)	4	(44)	2	(22)	0	(0)	
	ID-M	3.65	1.27	17	6	(35)	3	(18)	5	(29)	2	(12)	1	(6)	-	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	ID-Mmod	3.43	1.62	24	7	(100)	3	(43)	2	(29)	1	(14)	1	(14)	4.00	0.00	4	0	(0)	4	(100)	0	(0)	0	(0)	0	(0)	
	ID-Mod	3.20	0.41	15	0	(0)	3	(20)	12	(80)	0	(0)	0	(0)	2.17	0.51	18	0	(0)	1	(6)	1	(6)	16	(89)	0	(0)	
	ID-S	3.00	0.00	2	0	(0)	0	(0)	2	(100)	0	(0)	0	(0)	-	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	PD	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.00	1.32	9	2	(22)	1	(11)	1	(11)	2	(56)	0	(0)	
	NC	3.00	0.94	17	0	(0)	6	(35)	6	(35)	4	(24)	1	(6)	2.80	1.28	46	5	(11)	9	(20)	13	(28)	10	(22)	9	(20)	0.672
	ID	3.38	1.04	41	9	(22)	6	(15)	21	(51)	3	(7)	2	(5)	2.50	0.86	22	0	(0)	5	(23)	1	(5)	16	(73)	0	(0)	---
Parents	SSD	-	-												-	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	VI	2.13	1.25	8	1	(13)	0	(0)	0	(0)	5	(63)	2	(25)	2.48	1.03	21	0	(0)	5	(24)	3	(14)	10	(48)	3	(14)	
	HI	2.60	1.14	5	0	(0)	1	(20)	2	(40)	1	(20)	1	(20)	3.29	0.49	7	0	(0)	2	(29)	5	(71)	0	(0)	0	(0)	
	ID-M	2.50	0.85	10	0	(0)	1	(10)	4	(40)	4	(40)	1	(10)	-	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	
	ID-Mmod	2.92	0.76	13	0	(0)	3	(23)	6	(46)	4	(31)	0	(0)	3.22	1.20	9	1	(11)	3	(33)	3	(33)	1	(11)	1	(11)	
	ID-Mod	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.00	1.22	5	1	(20)	0	(0)	2	(40)	2	(40)	0	(0)	
	ID-S	3.00	1.15	4	0	(0)	2	(50)	0	(0)	2	(50)	0	(0)	2.33	0.58	3	0	(0)	0	(0)	1	(33)	2	(67)	0	(0)	
	PD	-	-	-	-	(-)	-	(-)	-	(-)	-	(-)	-	(-)	3.00	0.63	6	0	(0)	1	(17)	4	(67)	1	(17)	0	(0)	
	NC	2.50	1.37	16	2	(13)	2	(13)	2	(13)	6	(38)	4	(25)	2.74	0.93	34	0	(0)	8	(24)	12	(35)	11	(32)	3	(9)	
	ID	2.78	0.85	27	0	(0)	6	(22)	10	(37)	10	(37)	1	(4)	3.00	1.12	17	2	(12)	3	(18)	6	(35)	5	(29)	1	(6)	

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

The two most common types of parental support were allowing their children to attend IT courses and encouraging their children to make use of community resources such as computer facilities in community centres and digital resources in libraries

Parents were further asked about ways in which they showed support for their children's learning with the use of IT (Table 8.115, [E7-1/E7-2]PQ16). The two most common types of parental support were allowing their children to attend IT courses (NC parents=MS1: 45%, MS2: 25%; ID parents=MS1: 20%, MS2: 36%) and encouraging their children to make use of community resources such as computer facilities in community centres and digital resources in libraries (NC parents=MS1: 34%, MS2: 31%; ID parents=MS1: 28%, MS2: 45%). Other common types of parental support were buying IT-related hardware or software (NC parents=MS1: 29%, MS2: 30%; ID parents=MS1: 14%, MS2: 29%) and educational software (NC parents=MS1: 24%, MS2: 21%; ID parents=MS1: 13%, MS2: 20%) for their children. No more than 20% of the parents indicated that they supported their children by reading IT-related books themselves (NC parents=MS1: 18%, MS2: 9%; ID parents=MS1: 13%, MS2: 17%) and participating in IT learning with their children (NC parents=MS1: 13%, MS2: 8%; ID parents=MS1: 8%, MS2: 4%).

Table 8.115 Ways of parental support for their children on using IT in learning ([E7-1/E7-2] PQ16)

Ways of parental support	Percentage (%)		Percentage (%)	
	NC		ID	
	MS1 (N=38)	MS2 (N=87)	MS1 (N=90)	MS2 (N=76)
Allowing your child to attend IT courses	45	25	20	36
Encouraging your child to make use of community resources (e.g. computer facilities in community centers and digital resources in libraries)	34	31	28	45
Buying IT-related hardware/software for your child	29	30	14	29
Allowing your child to read IT -related books	26	25	18	21
Attending IT courses yourself	24	10	8	14
Buying educational software for your child	24	21	13	20
Reading IT-related books yourself	18	9	13	17
Participating in IT learning with your child	13	8	8	4
Other support	26	15	22	22
No special support	16	29	33	22

Multiple responses items

Students tended to be satisfied with the technical and learning support from family, except ID students who perceived a lower level of satisfaction with this aspect

Other types of family support include technical support and learning support. In MS1, 50% or more of NC students and more than 30% or more of ID students were satisfied or very satisfied with the technical support (53% of NC and 30% of ID) and learning support (50% of NC and 31% of ID) from family. In MS2, 60% or more of NC students and ID students were satisfied or very satisfied with the technical support (61% of NC and 64% of ID) and learning support (62% of NC and 74% of ID) from family. No statistically significant difference was noted in MS2 for NC students (Table 8.116, [E6-1]SQ8b.ii,14c.ii, [E6-2/E6-3]SQ9b.ii,15c.ii, [E6-4/E6-5/E6-6]SQ10b.ii,17c.ii). Students' responses revealed a reasonable level of satisfaction with the support from family.

Table 8.116 Students' levels of satisfaction with the technical support and learning support from family ([E6-1]SQ8b.ii,14c.ii, [E6-2/E6-3]SQ9b.ii,15c.ii, [E6-4/E6-5/E6-]SQ10b.ii,17c.ii)

Special school types		Mean (1-5)	SD	N	Count (%) of Students choosing the option										*P*-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the technical support from family															
NC	MS1	3.38	1.24	78	14	(18)	27	(35)	23	(29)	3	(4)	11	(14)	0.340
	MS2	3.67	1.06	159	37	(23)	60	(38)	43	(27)	11	(7)	8	(5)	
ID	MS1	3.07	0.88	112	4	(4)	29	(26)	55	(50)	18	(16)	6	(5)	---
	MS2	3.65	0.68	60	4	(7)	34	(57)	19	(32)	3	(5)	0	(0)	
Levels of satisfaction with the learning support from family															
NC	MS1	3.41	1.09	44	6	(14)	16	(36)	16	(36)	2	(5)	4	(9)	0.160
	MS2	3.75	1.04	113	31	(27)	39	(35)	30	(27)	10	(9)	3	(3)	
ID	MS1	3.20	0.89	87	7	(8)	20	(23)	49	(57)	7	(8)	5	(5)	---
	MS2	3.79	0.51	47	2	(4)	33	(70)	12	(26)	0	(0)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Parents tended to be willing to invest more resources for their children to use IT in learning

Parents showed positive attitude and contributed in various ways to support students' learning with IT. 50% and 44% of NC as well as 49% and 32% of ID parents in MS1 and MS2 respectively were willing or very willing to invest more resources such as time and money for their children to use IT in learning. The mean ratings for NC and ID parents were 3.39-3.56 (SD:0.72-0.77) and 3.13-3.37 (SD:0.84-0.90) respectively on a scale of 1 to 5 where 1 was 'totally not willing' and 5 was 'very willing' (Table 8.117, [E7-1/E7-2]PQ17).

Table 8.117 Parents' levels of willingness to invest more resources for their children to use IT in learning [S7]PQ16)

Special school types		Mean (1-5)	SD	N	Count (%) of Parents choosing the option									
					Very willing		Willing		Maybe (一般)		Not very willing (不願意)		Totally not willing	
NC	MS1	3.56	0.77	36	4	(11)	14	(39)	16	(44)	2	(6)	0	(0)
	MS2	3.39	0.72	87	3	(3)	36	(41)	41	(47)	6	(7)	1	(1)
ID	MS1	3.37	0.90	84	5	(6)	37	(43)	29	(35)	10	(12)	3	(4)
	MS2	3.13	0.84	76	3	(4)	21	(28)	37	(49)	13	(17)	2	(3)

Mean: 1="Totally not willing" and 5="Very willing"

8.7.2 Community-wide Involvement

Promoting community-wide support is emphasized by the EMB. This support could be enhanced by collaborative schemes and partnership with private sector and NGOs in terms of training for teachers or IT technical staff and providing digital resources. The extent of schools making use of community resources and taking part in school-community collaboration activities indicates the achievement of the EMB measures in this regard.

8.7.2.1 Community-school Collaboration

Amongst those schools which launched pilot schemes or sharing activities, 56% of the schools collaborated with "local tertiary institutions" and "local primary, secondary and special schools" to launch pilot projects while 77% and 90% of the schools collaborated with "local primary, secondary and special schools" to organise sharing activities on the use of IT for teaching in MS1 and MS2 respectively

The extent of the involvement of schools in community-school collaboration activities is studied in this survey. School heads were asked about how their schools collaborated with community organisations in pilot schemes or sharing activities on the use of IT for teaching. Among the 14 special schools which launched pilot projects on the use of IT for teaching in the 2004/05 school year in MS1, about two-thirds of the schools (64%) had collaborated with other organisations (Tables 8.101, [E2-1/E2-2]HQ16a,b). 56% of these schools collaborated with "local tertiary institutions", 33% with the EMB. 33% collaborated with "local primary, secondary and special schools". Only 22% collaborated with "local community or commercial organisations". In MS2, among the 22 special schools which launched pilot projects on the use of IT for teaching in the 2005/06 school year, 41% of these schools had collaborated with other organisations. 56% of these schools collaborated with "local primary, secondary and special schools". 44% of them collaborated with "local tertiary institutions" and the EMB. Only 33% collaborated with "local community or commercial organisations". No statistically significant difference was found in MS2 (Table 8.118, [E2-1/E2-2]HQ16c).

Among the 25 special schools which organised sharing activities on the use of IT for teaching in the 2004/05 school year, 52% of these schools had collaborated with other organisations in MS1 (Table 8.58, [E2-1/E2-2]HQ17a,b). 77% of the schools most often collaborated with "local primary, secondary and special schools", followed by "local tertiary institutions" (31%). 15% of them collaborated with "local community or commercial organisations" and the "EMB". Only 8% of the schools organised sharing activities with organisations or tertiary institutions in Mainland China and Macao. In MS2, among the 25 special schools which organised sharing activities on the use of IT for teaching in the 2005/06 school year, 40% of these schools had collaborated with other organisations. 90% of the schools most often collaborated with "local primary, secondary and special schools", followed by "EMB" (50%). 30% of them collaborated with "local community or commercial organisations". No statistically significant difference was found in MS2 (Table 8.118, [E2-1/E2-2]HQ17c).

Table 8.118 Organisations which jointly organised pilot schemes and sharing activities on the use of IT for teaching with schools ([E2-1/E2-2]HQ16c,17c)

Organisations	Percentage (%) of School heads choosing the options					
	Pilot schemes			Sharing activities		
	MS1 (N=9)	MS2 (N=9)	*P*-value	MS1 (N=13)	MS2 (N=10)	*P*-value
Local tertiary institutions	56	44	0.730 [c]	31	10	0.410 [c]
Education and Manpower Bureau	33	44	0.730 [c]	15	50	0.166 [c]
Local primary, secondary, and special schools	33	56	0.436 [c]	77	90	0.605 [c]
Local community/commercial organisations	22	33	0.730 [c]	15	30	0.563 [c]
Schools/community organisations/commercial organisations/tertiary institutions in Mainland China and Macao	0	0	1.000 [c]	8	0	0.784 [c]
Oversea schools/community organisations/commercial organisations/tertiary institutions	0	0	1.000 [c]	0	0	1.000 [c]

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001. [c] Mann-Whitney U Test (1-tailed Sig.)

Less than 20% of the teachers participated in ITEd professional development programmes or activities run by the IT industries, tertiary institutions and the HKEdCity respectively

Community also provided ITEd professional development programmes or activities for teachers. When teachers were asked about their actual participation in ITEd professional development programmes or activities in the 2004/05 and 2006/07 school years, these programmes or activities were run by organisations such as their schools (NC teachers=MS1: 77%, MS2: 65%; ID teachers=MS1: 67%, MS2: 71%) and the EMB (NC teachers=MS1: 52%, MS2: 45%; ID teachers=MS1: 47%, MS2: 52%). Less than 30% of the teachers indicated that they had participated in the professional development programmes or activities provided by outside bodies like other schools (NC teachers=MS1: 29%, MS2: 15%; ID teachers=MS1: 16%, MS2: 24%), the HKEdCity (NC teachers=MS1: 17%, MS2: 8%; ID teachers=MS1: 9%, MS2: 19%), IT industries (NC teachers=MS1: 13%, MS2: 16%; ID teachers=MS1: 5%, MS2: 10%), tertiary institutions (NC teachers=MS1: 15%, MS2: 10%; ID teachers=MS1: 7%, MS2: 19%) and other professional or non-governmental organisations (NC teachers=MS1: 0%-10%, MS2: 0%-2%; ID teachers=MS1: 0%-7%, MS2: 0%-14%). No statistically significant difference was found in MS2 (Table 8.119, [E5]TQ22b).

Table 8.119 The organisations that teachers participated in the ITEd professional development programmes/activities ([E5]TQ22b)

Organisations/institutions which organised ITEd professional development programmes/activities	Percentage (%) NC		*P*-value	Percentage (%) ID	
	MS1 (N=52)	MS2 (N=62)		MS1 (N=43)	MS2 (N=21)
Your school	77	65	0.151	67	71
Education and Manpower Bureau [including Centres of Excellence(CoEs)]	52	45	0.474	47	52
Other schools	29	15	0.063	16	24
HKEdCity	17	8	0.136	9	19
Tertiary institutions (Please specify:_____)	15	10	0.357	7	19
IT industries	13	16	0.692	5	10
Hong Kong Professional Teachers' Union	10	2	0.058	7	14
The Hong Kong Computer Society	2	0	0.275	0	0
The Hong Kong Association for Computer Education	2	2	0.900	2	0
Hong Kong Federation of Education Workers	0	0	1.000	5	0
Others	2	2	0.900	0	0

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.7.2.2 Community Resources

School heads were quite satisfied (一般) that their schools made use of community resources and took part in community activities on the promotion of ITEd

For the use of community resources, 19% of school heads were satisfied that students and parents made appropriate use of community resources such as computer facilities in community centres and digital resources in libraries in MS1. No statistically significant difference was found in MS2 (Table 8.118, [E1-1/E1-2]HSQ7d). In MS1, 17% of school heads were satisfied that their schools made use of community resources such as Partners in Learning (PiL) and took part in community activities on the promotion of ITEd. No statistically significant difference was found in MS2 (Table 8.120, [E1-1/E1-2]HSQ7c).

Table 8.120 School heads' levels of satisfaction with making use of community resources and taking part in community activities on the promotion of ITEd ([E1-1/E1-2] HSQ7c,d)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option					*P*-value
				Very satisfied	Satisfied	Quite satisfied (一般)	Not satisfied	Totally not satisfied	
"The school always makes use of community resources [e.g. Partners in Learning (PiL) 育才計劃] and takes part in community activities on the promotion of ITEd."									
MS1	2.89	0.72	54	0 (0)	9 (17)	32 (59)	11 (20)	2 (4)	0.882
MS2	2.92	0.79	52	1 (2)	9 (17)	29 (56)	11 (21)	2 (4)	
"Students and parents make appropriate use of the community IT facilities and digital resources (e.g. computer facilities in the community centres and digital resources in the libraries)."									
MS1	2.91	0.73	54	0 (0)	10 (19)	31 (57)	11 (20)	2 (4)	0.678
MS2	2.87	0.71	52	0 (0)	9 (17)	28 (54)	14 (27)	1 (2)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

ITEd Team teachers tended to perceive the support from the community as beneficial and they perceived a higher level of agreement to the benefit of using the community IT facilities or digital resources to help needy students to lessen the digital divide

ITEd team teachers perceived the support from the community as significant. (Table 8.121, [E4-1/E4-2]ITQ7d.i-v). 78% and 74% of the ITEd team teachers in MS1 and MS2 respectively agreed or strongly agreed that the community IT facilities or digital resources could effectively help needy students to lessen the digital divide. 78% and 71% of the ITEd team teachers in MS1 and MS2 respectively agreed or strongly agreed that these resources could provide opportunities for schools to upkeep the latest ITEd development trend in the education sector. Around 60% of them agreed or strongly agreed that the use of community IT facilities or digital resources as beneficial to the following: to enhance sharing and collaboration in the use of IT for teaching between schools and the community (MS1:63%; MS2: 67%), to reduce schools' burden in developing IT facilities and digital resources (MS1: 61%; MS2: 58%) and to provide requisite technical support for the development of ITEd in schools (MS1: 60%; MS2: 65%) (Table 8.121, [E4-1/E4-2]ITQ7d.i-v).

School heads tended to perceive that the EMB made significant contributions to school development in ITEd

With regard to the extent of the contribution level of the provision of IT facilities and digital resources from different organisations to ITEd in schools, as reported in MS1, most of school heads (88%) perceived that the EMB made considerable or significant contributions to school development in ITEd. Less than half of them indicated that "Internet service providers" (46%), "software or hardware service providers" (41%), "IT application system developers" (40%) and "local primary, secondary and special schools" (36%) made considerable or significant contributions. Lower percentages of school heads considered that "professional education organisations" (24%), "tertiary institutions" (19%), "other government policy departments or bureau" (12%) and "community organisations or centres" (11%) made considerable or significant contributions, with mean ratings below 3.00. No statistically significant difference was found in MS2 (Table 8.122, [E2-1/E2-2]HQ14a.i-xi).

ITEd team teachers tended to perceive that IT facilities or resources provided by the HKEdCity were sufficient

When asked about the sufficiency of community IT facilities or resources as listed in Table 8.123 ([E4-1/E4-2]ITQ7b.i-x), 10% or less of the ITEd team teachers in MS1 found the support provided by the following organisations or institutions to be sufficient: the EMB (10%), the tertiary institutions (8%), IT-related professional organisations and non-governmental organisations (5%-8%) and IT industry (e.g. Partners in Learning) (5%). The mean ratings fell in the range of 2.55 to 2.88 (SD:0.60-0.77) on a scale of 1 to 5 where 1 was 'totally insufficient' and 5 was 'very sufficient'. The only exception was the HKEdCity. 48% of the ITEd team teachers found the support to be sufficient with a mean rating of 3.43 (SD:0.59) on a scale of 1 to 5 where 1

was ‘totally insufficient’ and 5 was ‘very sufficient’. In MS2, 42% and 23% of ITEd Team teachers respectively found the support of the HKEdCity and the EMB to be sufficient or very sufficient. 10% or less of them found the support provided by other listed organisation as sufficient or very sufficient.

In general, 10% of the ITEd team teachers in MS1 and in MS2 perceived the provision of community IT facilities or digital resources to be sufficient whereas 18% and 32% rated them as insufficient or totally insufficient, with a mean rating of 2.90 (SD:0.59) and 2.74 (SD:0.68) on a scale of 1 to 5 where 1 was ‘totally insufficient’ and 5 was ‘very sufficient’. (Table 8.124, ([E4-1/E4-2]ITQ7c). Higher proportion of school heads indicated the positive responses to the sufficiency of this aspect. 33% and 39% of school heads in MS1 and in MS2 respectively considered such resources as sufficient or very sufficient and 21% and 17% rated them as insufficient or totally insufficient, with a mean rating of 3.10 (SD:0.77) and 3.23 (SD:0.76) on a scale of 1 to 5 where 1 was ‘totally insufficient’ and 5 was ‘very sufficient’. (Table 8.124, ([E2-1/E2-2]HQ14b).

Table 8.121 ITEd Team teachers' levels of agreement on the benefits of community IT facilities/digital resources ([E4-1/E4-2]ITQ7d.i-v)

	MS1										MS2									
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option						
				Strongly agree		Agree		Neutral		Disagree				Strongly agree		Agree		Neutral		Disagree	
i.	3.58	0.84	40	4	(10)	20	(50)	11	(28)	5 (13)	0 (0)	3.71	0.78	31	4	(13)	16	(52)	9	(29)	2 (6)	0 (0)
ii.	3.48	0.93	40	3	(8)	21	(53)	9	(23)	6 (15)	1 (3)	3.61	0.76	31	3	(10)	15	(48)	11	(35)	2 (6)	0 (0)
iii	3.85	0.70	40	5	(13)	26	(65)	7	(18)	2 (5)	0 (0)	3.87	0.72	31	5	(16)	18	(58)	7	(23)	1 (3)	0 (0)
iv.	3.63	0.81	40	4	(10)	21	(53)	11	(28)	4 (10)	0 (0)	3.68	0.70	31	2	(6)	19	(61)	8	(26)	2 (6)	0 (0)
v.	3.83	0.68	40	4	(10)	27	(68)	7	(18)	2 (5)	0 (0)	3.81	0.70	31	4	(13)	18	(58)	8	(26)	1 (3)	0 (0)

Benefits of community IT facilities/digital resources

i. To provide requisite technical support for the development of ITEd in school
ii. To reduce school's burden in developing IT facilities and digital resources
iii. To help needy students to lessen the digital divide
iv. To enhance sharing and collaboration on the use of IT for teaching between school and the community
v. To provide opportunities for school to upkeep with the latest ITEd development and trend in the education sector

Mean: 1="Strongly disagree" and 5="Strongly agree"

Table 8.122 School heads' perception of contribution from community organisations to ITEd in schools ([E2-1/E2-2]HQ14a.i-xi)

	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							
				Significant contribution		Considerable contribution		Some contribution (一般)		Little contribution	None				Significant contribution		Considerable contribution		Some contribution (一般)		Little contribution	None	
i.	4.45	0.75	58	34	(59)	17	(29)	6	(10)	1 (2)	0 (0)	4.27	0.79	52	24	(46)	19	(37)	8	(15)	1 (2)	0 (0)	0.192
ii.	2.50	1.03	58	1	(2)	7	(12)	25	(43)	12 (21)	13 (22)	2.48	0.96	52	1	(2)	6	(12)	18	(35)	19 (37)	8 (15)	0.794
iii	2.55	0.96	58	2	(3)	5	(9)	24	(41)	19 (33)	8 (14)	2.33	0.92	52	2	(4)	2	(4)	15	(29)	25 (48)	8 (15)	0.140
iv.	2.79	0.91	58	1	(2)	10	(17)	29	(50)	12 (21)	6 (10)	2.69	1.11	52	1	(2)	14	(27)	14	(27)	14 (27)	9 (17)	0.650
v.	3.14	0.96	58	3	(5)	18	(31)	25	(43)	8 (14)	4 (7)	3.23	0.94	52	4	(8)	16	(31)	22	(42)	8 (15)	2 (4)	0.699
vi.	2.81	0.95	58	1	(2)	13	(22)	23	(40)	16 (28)	5 (9)	2.46	0.94	52	0	(0)	8	(15)	16	(31)	20 (38)	8 (15)	0.057
vii.	2.47	0.90	58	1	(2)	5	(9)	22	(38)	22 (38)	8 (14)	2.13	0.99	52	0	(0)	6	(12)	11	(21)	19 (37)	16 (31)	0.056
viii.	2.48	1.11	58	3	(5)	6	(10)	20	(34)	16 (28)	13 (22)	2.48	1.09	52	1	(2)	8	(15)	19	(37)	11 (21)	13 (25)	0.896
ix.	3.17	0.98	58	3	(5)	21	(36)	20	(34)	11 (19)	3 (5)	3.19	0.93	52	3	(6)	17	(33)	21	(40)	9 (17)	2 (4)	0.992
x.	3.31	1.08	58	7	(12)	20	(34)	19	(33)	8 (14)	4 (7)	3.33	0.90	52	5	(10)	16	(31)	23	(44)	7 (13)	1 (2)	0.865
xi.	3.12	1.06	58	4	(7)	19	(33)	20	(34)	10 (17)	5 (9)	3.29	0.91	52	3	(6)	20	(38)	20	(38)	7 (13)	2 (4)	0.431

Organisations

i. Education and Manpower Bureau
ii. Commerce, Industry and Technology Bureau/Innovation and Technology Commission
iii. Other government policy departments/bureau
iv. Tertiary institutions
v. Local primary, secondary and special schools
vi. Professional education organisations
vii. Community organisations/centres
viii. Mass media (e.g. TV and radio)
ix. Software/hardware service providers
x. Internet service providers
xi. IT application system developers

Mean: 1="None" and 5="Significant contribution"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Table 8.123 ITEd Team teachers' perception of the sufficiency of IT facilities/resources provided by the community to schools ([E4-1/E4-2]ITQ7b.i-x)

	MS1										MS2									
	Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option							Mean (1-5)	SD	N	Count (%) of ITEd Team teachers choosing the option						
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient								
i.	2.88	0.61	40	0	(0)	4	(10)	28	(70)	7	(18)	1	(3)	2.87	0.88	31	0	(0)	7	(23)	16	(52)	5	(16)	3	(10)
ii.	3.43	0.59	40	0	(0)	19	(48)	19	(48)	2	(5)	0	(0)	3.32	0.75	31	1	(3)	12	(39)	14	(45)	4	(13)	0	(0)
iii	2.65	0.77	40	0	(0)	3	(8)	24	(60)	9	(23)	4	(10)	2.74	0.68	31	0	(0)	2	(6)	21	(68)	6	(19)	2	(6)
iv.	2.73	0.64	40	0	(0)	3	(8)	24	(60)	12	(30)	1	(3)	2.68	0.70	31	0	(0)	1	(3)	22	(71)	5	(16)	3	(10)
v.	2.73	0.60	40	0	(0)	2	(5)	26	(65)	11	(28)	1	(3)	2.68	0.60	31	0	(0)	0	(0)	23	(74)	6	(19)	2	(6)
vi.	2.60	0.63	40	0	(0)	2	(5)	21	(53)	16	(40)	1	(3)	2.39	0.76	31	0	(0)	0	(0)	17	(55)	9	(29)	5	(16)
vii.	2.55	0.68	40	0	(0)	2	(5)	20	(50)	16	(40)	2	(5)	2.42	0.76	31	0	(0)	0	(0)	18	(58)	8	(26)	5	(16)
viii.	2.70	0.65	40	0	(0)	2	(5)	26	(65)	10	(25)	2	(5)	2.71	0.74	31	0	(0)	3	(10)	18	(58)	8	(26)	2	(6)
ix.	2.55	0.64	40	0	(0)	0	(0)	25	(63)	12	(30)	3	(8)	2.45	0.68	31	0	(0)	0	(0)	17	(55)	11	(35)	3	(10)
x.	0.00	0.00	0	0	(0)	0	(0)	0	(0)	0	(0)	0	(0)	3.00	0.00	1	0	(0)	0	(0)	1	(100)	0	(0)	0	(0)

Organisations

i. Education and Manpower Bureau
ii. HKEdCity
iii. Tertiary institutions
iv. The Hong Kong Computer Society
v. The Hong Kong Association for Computer Education
vi. Hong Kong Professional Teachers' Union
vii. Hong Kong Federation of Education Workers
viii. IT Industries [e.g. Partners in Learning (PiL) 育才計劃]
ix. Voluntary organisations
x. Others

Mean: 1="Totally insufficient" and 5="Very sufficient"

Table 8.124 School heads' and ITEd Team teachers' perception of the sufficiency of IT facilities/resources provided by the community to schools ([E2-1/E2-2]HQ14b, [E4-1/E4-2]ITQ7c)

Stakeholder	MS1										MS2										*P*-value
	Mean (1-5)	SD	N	Count (%) of Students choosing the option							Mean (1-5)	SD	N	Count (%) of Students choosing the option							
				Very sufficient		Sufficient		Quite sufficient (一般)		Insufficient		Totally insufficient									
ITEd Team teachers	2.90	0.59	40	0	(0)	4	(10)	29	(73)	6	(15)	1	(3)	2.74	0.68	31	0	(0)	3	(10)	18	(58)	9	(29)	1	(3)	---
School heads	3.10	0.77	58	0	(0)	19	(33)	27	(47)	11	(19)	1	(2)	3.23	0.76	52	1	(2)	19	(37)	23	(44)	9	(17)	0	(0)	0.452

Mean: 1="Totally insufficient" and 5="Very sufficient"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.7.2.3 Students' Participation in Activities Provided by the Community

More students reported using computers in public libraries than in community centres or youth centres

When students were asked to indicate their usage of community IT facilities, more special students reported using computers in public libraries (NC students=MS1=MS2: 20%; ID students=MS1: 30%, MS2: 20%) than in community centres or youth centres (NC students=MS1: 7%, MS2: 10%; ID students=MS1: 6%, MS2: 8%). No statistically significant difference was observed in the percentage of NC students in MS2 (Table 8.125, [E6-2]SQ8e, [E6-3]SQ8g, [E6-4/E6-5/E6-6]SQ9g).

Table 8.125 Locations that student used computers other than at their own school and at home ([E6-2]SQ8e, [E6-3]SQ8g, [E6-4/E6-5/E6-6]SQ9g)

Locations	Percentage (%) of Students choosing the options				
	NC			ID	
	MS1 (N=71)	MS2 (N=143)	*P*-value	MS1 (N=117)	MS2 (N=60)
Others' home (e.g. fellow students/ friends/ relatives)	42	39	0.394	22	7
Internet Café	23	25	0.233	6	13
Public libraries	20	20	0.575	30	20
Community centres / Youth centres	7	10	0.836	6	8
Other schools	1	3	0.369	1	7
Others	11	10	0.595	13	0
Only use the computers in school / at home	46	53	0.138	62	87

Multiple responses items; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Students were quite satisfied (一般) with the technical and learning support from the community

As for the technical support, 25% and 27% of NC as well as 24% and 20% of ID students in MS1 and MS2 respectively were satisfied or very satisfied with the technical support from the community (Table 8.126, [E6-2/E6-3]SQ9b.iii, [E6-4/E6-5/E6-6]SQ10b.iii). Among those students who received learning support from others during the learning process, 24% and 35% of NC as well as 17% and 51% of ID students in MS1 and MS2 respectively reported that they found the learning support from the community to be satisfied or very satisfied (Table 8.126, [E6-2/E6-3]SQ15c.iii, [E6-4/E6-5/E6-6]SQ17c.iii). No statistically significant difference was observed in the percentages of NC students in these two aspects in MS2.

Table 8.126 Students' levels of satisfaction with the technical support and learning support from the community ([E6-2/E6-3]SQ9b.iii,15c.iii, [E6-4/E6-5/E6-6]SQ10b.iii, 17c.iii)

Special school types		Mean (1-5)	SD	N	Count (%) Students choosing the option										P-value
					Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
Levels of satisfaction with the technical support from the community															
NC	MS1	2.90	1.07	68	5	(7)	12	(18)	30	(44)	13	(19)	8	(12)	0.783
	MS2	2.91	1.21	143	21	(15)	17	(12)	51	(36)	36	(25)	18	(13)	
ID	MS1	3.03	0.93	110	8	(7)	19	(17)	57	(52)	20	(18)	6	(5)	---
	MS2	3.00	1.01	60	6	(10)	6	(10)	36	(60)	6	(10)	6	(10)	
Levels of satisfaction with the learning support from the community															
NC	MS1	2.94	1.07	34	3	(9)	5	(15)	17	(50)	5	(15)	4	(12)	0.991
	MS2	3.09	1.21	102	18	(18)	17	(17)	31	(30)	28	(27)	8	(8)	
ID	MS1	3.01	0.89	87	6	(7)	9	(10)	58	(66)	8	(9)	7	(8)	---
	MS2	3.40	0.68	47	0	(0)	24	(51)	18	(38)	5	(11)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.7.3 Digital Divide

School heads tended to be satisfied with their schools setting up concrete programmes to minimize the effect of digital divide

Regarding the concrete programmes that schools set up to minimize the effect of digital divide, 33% of school heads were satisfied or very satisfied with this aspect in MS1. No statistically significant difference was noted in MS2 (Table 8.127, [E1-1/E1-2]HSQ7b).

Table 8.127 School heads' levels of satisfaction with their schools setting up concrete programmes to minimize the effect of digital divide ([E1-1/E1-2]HSQ7b)

	Mean (1-5)	SD	N	Count (%) of School Heads choosing the option								*P*-value
				Very satisfied		Satisfied		Quite satisfied (一般)		Not satisfied		Totally not satisfied		
"The school sets up concrete programme(s) to minimize the effect of digital divide (數碼隔閡)."														
MS1	3.30	0.60	54	1	(2)	17	(31)	33	(61)	3	(6)	0	(0)	0.518
MS2	3.21	0.75	52	2	(4)	15	(29)	27	(52)	8	(15)	0	(0)	

Mean: 1="Totally not satisfied" and 5="Very satisfied"; Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

Home computers were quite widely available to students, but Internet access was not extensively available to all the low income group families having monthly income below $10,000

A wide range of measures have been taken by the EMB to eliminate the 'digital divide'. 90% and 88% of the low income group families which had a monthly income below $10,000 had personal computers at home in MS1 and MS2 respectively. 78% of them had Internet access at home in both MS1 and MS2. 89% of them used broadband whereas 11% used dialup connection at home in both MS1 and MS2 (Table 8.128, [E7-1/E7-2]PQ11,12a,b,26). These figures suggested that home computers were quite widely available for special school students in the low income group. However, it was noteworthy that Internet access was not extensively available to all of them.

Table 8.128 Families with personal computer, Internet access at home and mode of Internet connection by monthly family income ([E7-1/E7-2]PQ11,12a,b,25)

IT facilities at home	Percentage (%) of families in special schools											
	MS1						MS2					
	Total Monthly income of the family per month				Association between digital divide and income		Total Monthly income of the family per month				Association between digital divide and income	
	Below $10,000 (N=49) #	$10,000-30,000 (N=33) #	Above $30,000 (N=12) #	Overall (N=94) #	χ^2 (df=2)	*P*-value	Below $10,000 (N=81) #	$10,000-30,000 (N=55) #	Above $30,000 (N=20) #	Overall (N=156) #	χ^2 (df=2)	*P*-value
Personal Computer (s)	90	85	92	88	0.618	0.734	88	95	90	90	1.794	0.408
Internet access	78	76	92	79	1.414	0.493	78	80	90	80	1.506	0.471
Mode of Internet	(N=38) #	(N=25) #	(N=11) #	(N=74) #			(N=63) #	(N=44) #	(N=18) #	(N=125) #		
-Broadband	89	92	100	92	1.269	0.530	89	89	78	87	1.674	0.433
-Dial up	11	8	0	8			11	11	22	13		

Number of response refers to valid cases related to corresponding computing. Chi-square Test: *p<0.05; **p<0.01; ***p<0.001.

Almost all schools opened computer rooms for students' use after school

Under the Second ITEd Strategy, computer recycling and donation in collaboration with the Parent-Teacher Associations or other parties to help needy students have been promoted in schools. Incentive grant for extending the opening hours of school computer facilities has been continually provided to help students with easy access to computers after school. In this regard, the extent of schools' attempt to take measures to address the digital divide issues is investigated. School heads were asked about the measures carried out to help needy students in using IT in their learning after school (Table 8.129, [E2-1/E2-2]HQ10a-e). In MS1, 79% of school heads indicated that they had opened computer rooms for students' use after school. 61% of schools had portable computers loaned to poor or needy students for use at home. 52% of schools indicated that students had applied for computers (including recycled computers) from related organisations. 18% of schools had called for donation or recycled computers from parents or students. A statistically significant increase was noted in the percentage of schools having called for donation or recycled computers from parents or students (from 18% to 37%) in MS2. As reported in Section 8.5.1.4, 42% of NC students considered the opening hours to be sufficient or very sufficient in MS1. No statistically significant difference was noted for NC students in this aspect in MS2. 66% and 51% of ID students in MS1 and MS2 respectively regarded the opening hours to be sufficient or very sufficient (Table 8.93, [E6-1/E6-2/E6-3]SQ7e, [E6-4/E6-5/E6-6]SQ8e). The results showed that initial measures in extending the opening hours of school facilities and provision of portable computers to needy students had been implemented by almost 80% of schools, while further measure such as computer recycling had yet to be put forward in MS1 and there was a statistically significant increase for this measure in MS2.

Table 8.129 Measures taken to help needy students use IT in their learning after school in 2004/05 and 2005/06 school years ([E2-1/E2-2]HQ10a-e)

Measures taken to help needy students use IT in their learning after school	Percentage (%)		*P*-value
	MS1 (N=56)	MS2 (N=52)	
a. Computer room(s) was/were opened for students' use after school	79	79	0.972
b. Portable computers were loaned to poor/needy students for use at home	61	62	0.930
d. Students applied for computers (including recycled computers) from related organisations [e.g. non-government organisations (NGOs) and IT industries]	52	63	0.222
e. Call for donation of / recycled computers from students / parents	18	37	0.029*
c. Arranged students to buy computer equipment by installments	2	6	0.276

Mann-Whitney U Test: *p<0.05; **p<0.01; ***p<0.001.

8.8 Summary of the Section

8.8.1 Strategic Goal 1 Empowering Learners with IT

Proficiency in Computing Skills: School heads tended to be satisfied with students' IT knowledge and skills. The promotion of ITEd in schools produced positive outcomes on NC students' learning in terms of mastery of IT skills to use software and hardware. In MS1, approximately half of NC students indicated that they were proficient or highly proficient in using software and hardware such as "online information searching tools" (52%), "Chinese input" (46%), "keyboard" (57%) and "printer" (46%). A statistically significant increase was observed in the percentage of NC students who rated themselves as proficient or highly proficient in using "keyboard" (MS1: 57%; MS2: 64%) in MS2. ID students rated themselves as not proficient in using software [mean values (SD): MS1:1.42-1.95 (1.05-1.39), MS2: 1.25-2.28 (0.68-1.43) where 1='know nothing at all' and 5='highly proficient'] and hardware [mean values (SD): MS1: 1.36-1.91 (0.99-1.41), MS2: 1.80-2.32 (0.88-1.33)].

Attitude towards Social and Ethical Issues of Using IT: School heads were quite satisfied (一般) with students' attitude towards social and ethical issues of using IT. Students generally showed themselves as responsible users of IT. In MS1, they agreed or strongly agreed to "beware of e-mail bombs or the spread of computer virus" (67% of NC and 65% of ID) and "avoid spending long hours on computers or online games" (68% of NC and 79% of ID). They disagreed or strongly disagreed on "surfing pornographic websites" (66% of NC and 69% of ID), "using pirated software" (53% of NC and 63% of ID) and "disclosing personal particulars to strangers online" (70% of NC and 64% of ID). On the other hand, students were less concerned about the issue of "sending or forwarding unnecessary e-mails or messages" when using IT. 47% of NC and 43% of ID students disagreed or strongly disagreed on this social and ethical issue. No statistically significant difference was noted for the NC students in MS2. For ID students in MS2, 60% and 67% of them respectively agreed or strongly agreed to "avoid spending long hours on computer or online games" and "beware of e-mail bombs or the spread of computer virus". 45% of them disagreed or strongly disagreed on "sending or forwarding unnecessary e-mails or messages" and "surfing pornographic websites".

Belief and Attitude towards Use of IT for Learning: Most students showed positive attitude towards the use of IT for learning. In MS1, around 95% of them indicated that they liked to use computers for learning in class (95% of NC and 96% of ID) while 81% of NC and 79% of ID students liked to use computers for learning beyond school hours. No statistically significant difference was noted for the NC students in MS2. 92% and 82% of ID students respectively liked using computers for learning in class and beyond school hours in MS2.

Learning Activities with IT: NC students spent more time on using computers at home or in other places than in school while ID students spent more time on using computers in school than at home. 46% of NC and 45% of ID students in MS1 spent less than 2 hours per day on using computers in school while 40% of NC and 46% of ID students spent 2 hours or more per day on using computers in school during the week prior to the conduct of the questionnaire survey. No statistically significant difference was noted for the NC students in MS2. As for ID students, 53% of them spent less than 2 hours per day on using computers in school while 46% of them spent 2 hours or more per day during the week prior to the conduct of the questionnaire survey. Only 2% of them did not use computers in school. 35% of NC and 47% of ID students in MS1 spent less than 2 hours a day in using computers at home or in other places during the week prior to the conduct of the questionnaire survey. In contrast, 47% of NC and 31% of ID students spent 2 hours or more a day on using computers at home or in other places respectively. No statistically significant difference was observed for NC students in MS2. As for ID students in MS2, 37% of

them spent less than 2 hours per day on using computers at home or in other places while 25% of them spent 2 hours or more per day during the week prior to the conduct of the questionnaire survey while 38% of them did not use computers at home or in other places.

With respect to the learning activities with IT, students were given the opportunities to use computers in class other than Computer or IT lessons. In MS1, 71% of NC and 61% of ID students reported that they used computers 1 to 10 times in class while 12% of NC and 32% of ID students reported that they used computers in class 11 times or more apart from Computer or IT lessons during the week prior to the conduct of the questionnaire survey. A statistically significant increase was found in the frequency of NC students using computers for learning in class in MS2 (from 12% to 41% reported using computers for 11 times or more during the week prior to the conduct of the questionnaire survey). As for ID students in MS2, 78% of them used computers in class 1 to 10 times a week while 20% of them used computers in class 11 times or more a week. Only 2% of them did not use computers in class.

Computers were the most frequently used in General Studies in ID schools (ID-M=MS1: 24%; ID-Mmod=MS1: 59%, MS2: 26%; ID-Mod=MS1: 48%, MS2: 69%; ID-S=MS2: 43%). Other more frequently reported subject areas in different types of special schools were Mathematics (HI=MS1: 56%; VI=MS1: 21%; ID-M=MS1: 22%; ID-Mmod=MS2: 26%; PD=MS2: 31%), English Language (H=MS2: 25%; SSD=MS2: 18%; PD=MS1: 71%, MS2: 21%), Chinese Language (HI=MS1: 44%, MS2: 22%; VI=MS2: 42%), Religious Studies (VI=MS1: 39%), Communications (ID-S=MS1: 29%), Music (H=MS1: 22%) as well as Art and Design (H=MS1: 22%, MS2: 25%).

NC students reported that teachers occasionally used IT in learning activities in school and these activities were mainly confined to information search. The findings with mean ratings below 3.00 indicated that the students in special schools were rarely required to use IT to accomplish different learning tasks except for PD, VI, SSD and ID-M students in MS1 as well as H, SSD, HI, ID-Mmod and PD students in MS2. The mean values in which SSD, ID-M and PD students in MS1 as well as H, SSD, HI, ID-Mmod and PD students in MS2 were required to use computers for “information search” fell in the range of 3.26-3.88 (SD:1.13-1.36) and 3.14-3.90 (SD:0.92-1.39) respectively on a scale of 1 to 5 where 1 was ‘never’ and 5 was ‘very frequently’. PD students in MS1 and H students in MS2 also were frequently required to use computers for “information selection” as well as “reporting and presentation”, with mean values of 3.38-3.50 (SD:0.76-1.06) and 3.42-3.52 (SD:0.77-1.06) respectively. SSD students were occasionally required to use computers for “information selection” with a mean rating of 3.04 (SD:1.15) in MS1 and 3.30 (SD:1.19) in MS2 .

With respect to the learning activities beyond school hours with the use of digital resources, 43% of NC and 34% of ID students in MS1 made use of the digital resources assigned by teachers to learn subject knowledge beyond school hours. 48% of NC and 26% of ID students took the initiative to make use of digital resources for self-learning beyond school hours. A statistically significant increase was observed in MS2 in the percentage of NC students using digital resources for learning assigned by teachers (from 43% to 54%) whereas a decrease was noted in the percentage of NC students (from 48% to 38%) who used digital resources on their own initiative for self-learning beyond school hours in MS2. As for ID students in MS2, 82% of ID students used digital resources assigned by their teachers/therapists and 20% of them took the initiative to make use of digital resources for self-learning beyond school hours.

Confidence in the Use of IT to Perform Learning Tasks: NC students were generally confident in using IT for learning, especially in information search. In terms of the perceived levels of confidence in using IT to perform different learning tasks, 46% of NC and 31% of ID students in MS1 rated themselves as confident or very confident in “information search”. Less than 40% of

NC students rated themselves as confident or very confident in "reporting and presentation" (39%), "information selection" (37%), "information collation and analysis" (31%) as well as "self-evaluation on learning outcomes" (28%). ID students considered themselves as not confident in aforementioned tasks (13% to 25% rated themselves as confident or very confident). No statistically significant difference was observed in MS2 for NC students. 14%-25% of ID students perceived themselves as confident or very confident in all listed items in MS2.

As for the confidence level in the use of IT to perform respective computing tasks, NC students were generally confident in using IT for computing tasks. In MS1, higher proportions of NC students rated themselves as confident or very confident in "Chinese input via the computer" (66%) and "English input via the computer" (69%). No statistically significant difference was found for NC students in MS2. As for ID students, 14%-27% of them in MS1 and 12%-30% in MS2 rated themselves as confident and very confident in all listed learning tasks respectively.

Learning Support: Students tended to perceive the learning support from teachers to be sufficient whereas teachers indicated occasional provision of learning support for students. In MS1, around half of the students (53% of NC and 47% of ID) reported that their teachers frequently or very frequently gave them support when they encountered difficulties in performing the learning activities with the use of IT. 59% of NC and 45% of ID students considered the support as sufficient or very sufficient in MS1. No statistically significant difference was reported in MS2 for NC students. As for ID side in MS2, 62% of the students and 43% of the teachers respectively reported that they frequently or very frequently received/provided learning support. 77% of ID students considered such support as sufficient or very sufficient in MS2.

School ITEd Curriculum: Concerning the opportunities given to students' use of IT in learning, school heads were satisfied that students were given the opportunities to learn about IT knowledge and skills. Nearly all special schools (98%) offered Computer or IT subjects in both MS1 and MS2. In MS1, software such as "word processing software", "presentation software", "online communication software", "online information searching tools", "computer graphics design software" and "Chinese input" were taught in elementary secondary levels (63%-70%). Hardware such as "printer", "CD-ROM writer", "digital camera", "scanner", "digital video recorder" and "keyboard" were taught in elementary secondary levels (52%-69%). Information-processing skills as well as moral and ethical issues of using IT were mainly taught in elementary secondary levels (57%-72%). "Word processing software", "printer", "keyboard", "Chinese input" and "information search" were also taught in senior primary levels (56%-65%). No statistically significant difference was observed in the percentages of schools which taught the use of different software and hardware as well as the correct attitude of using IT in the Computer/IT curriculum in MS2.

8.8.2 Strategic Goal 2 Empowering Teachers with IT

Teachers' IT competency: Special school heads tended to be very satisfied with teachers' IT competency. In general, teachers were generally proficient in software and hardware skills. Teachers were more proficient in using "word processing software", "presentation software", "online communication software", "online information searching tools" and "Chinese input" as well as in using standard input, output and storage devices in daily work such as "printer", "keyboard", "CD-ROM writer" and "digital camera". However, they were less proficient in using "audio or video editing software", "multi-media design software", "programming" and using hardware mobile agents such as "mobile devices" and "portable multi-media player devices" for edutainment.

Belief and Attitude towards Using IT for Learning and Teaching: Regarding the teachers' ITEd perception, teachers possessed positive attitude towards the impact of IT on learning and teaching. Teachers perceived the highest level of agreement that the use of IT could enhance teaching effectiveness, but they perceived a lower level of agreement that it could strengthen the relationship between teachers and students. With respect to their roles when applying IT in the learning, teaching and assessment processes, teachers perceived a higher level of agreement that they used IT to motivate students in the learning of KLAs as well as provided opportunities for students to acquire IT knowledge and skills, but they perceived a lower level of agreement that they used IT for monitoring and assessment of students' performance and learning progress. In general, teachers tended to be willing to allocate more time to apply IT in teaching. A statistically significant decrease was noted in the willingness of NC teachers to allocate more time to apply IT in teaching (from 54% to 39%) in MS2.

Teaching with IT: With regard to the application of IT, school heads were satisfied with teachers' use of IT in daily teaching and learning management as well as in promoting students to learn. Teachers adopted IT most frequently in General Studies and Chinese Language. Around 65% of the teachers used computers in class 1 to 10 times during the week prior to the conduct of the questionnaire survey in both MS1 and MS2. As for the mode of computer usage, special school teachers mainly used computers themselves for explanation and demonstration to the whole class and to support students in learning subject knowledge. Teachers occasionally conducted teaching by having students working individually with computers and they tended to have students working occasionally in groups with computers. Teachers occasionally used IT to design learning context to foster students' higher-order thinking capability and they tended to use IT to arrange small-group learning occasionally.

As for the use of digital resources, 44% and 34% of NC and ID teachers respectively in MS1 as well as 54% and 31% respectively in MS2 assigned digital resources to students for learning subject knowledge beyond school hours. Among them, 82% and 77% of NC and ID teachers respectively in MS1 as well as 65% and 78% respectively in MS2 assigned digital resources 1 to 4 times beyond school hours during the week prior to the conduct of the questionnaire survey. No statistically significant difference was found in the frequency of assigning digital resources to students by NC teachers in MS2. Teachers rarely used the listed electronic means for assessing or responding to students' learning situation.

Confidence in Using IT for Learning and Teaching: Concerning the confidence in using IT for learning and teaching, teachers tended to consider themselves as capable of integrating IT into teaching. Teachers perceived a higher level of confidence in selecting appropriate digital resources to conduct teaching and support students in learning the subject knowledge but they perceived a lower level of confidence in arranging small-group learning. Teachers perceived a higher level of agreement that their teaching could promote students' capability in information search, but they perceived a lower level of agreement that their teaching could promote students' capability in information collation and analysis as well as self-evaluation on learning outcomes.

School Professional Development in ITEd for Teachers: About half of the teachers in MS1 as well as 46% and 36% of NC and ID teachers respectively in MS2 had participated in the ITEd professional development programmes. No statistically significant difference was noted in MS2 for NC teachers. Around 70% of the teachers in MS1 as well as 61% and 74% of NC and ID teachers respectively in MS2 anticipated future participation. A statistically significant decrease was noted in the percentages of NC teachers who were willing or very willing to participate in these programmes in the future (from 69% to 61%) in MS2. Teachers tended to find the ITEd professional development programmes to be practical and they found that these programmes were quite sufficient (一般). Regarding their expectation of the themes and modes of professional development programmes or activities, the top two commonly selected themes were "IT

application in subject or cross-curricular teaching" and "use of new technology in teaching" and the top two commonly selected modes were "training courses" and "workshops".

School ITEd Sharing and Collaboration among Teachers: With respect to the promotion of ITEd, teachers tended to agree that they would share their teaching experience in using IT or teaching materials with colleagues and the others, but they perceived themselves having a lower level of capability to share their experience in promoting ITEd with the education community.

Areas for Improvement of ITEd Development: Teachers perceived some difficulties or obstacles in using IT in teaching. They were most concerned about the increase of teaching workload arising from the use of IT and the unsuitable design of general classrooms for teaching with IT. 71% to 83% of the teachers in MS1 and MS2 respectively agreed or strongly agreed that ITEd development could be better if the following could be achieved: increase in IT experts or professionals in schools, increase in the provision of digital resources for learning purposes, workload reduction as well as increase in IT facilities, digital resources or funding for the development of ITEd in schools and increase in teachers' ITEd professional development activities or opportunities.

8.8.3 Strategic Goal 3 Enhancing School Leadership for the Knowledge Age

School ITEd Plan: School heads and their associates were guided to establish visions and goals as well as to build teams appropriate for their school contexts in integrating IT into school planning, curricula as well as learning and teaching processes. School heads perceived a higher level of satisfaction with their school ITEd plans which stated clear visions and goals as well as covered the infrastructure requirements of schools. No statistically significant difference was noted in school heads' satisfaction level with school ITEd plans in MS2.

When formulating the school ITEd plans, school heads ranked improving students' use of IT in their learning as well as improving digital resources and the IT infrastructure in schools as the top two priorities in both MS1 and MS2, though there was a statistically significant decrease in the priority of improving students' use of IT in their learning (from 79% to 60%) in MS2.

ITEd team teachers participated in many tasks for the promotion of school ITEd. They tended to have considerable participation in encouraging teachers/therapists to make appropriate use of IT in teaching/therapy or training (MS1: 53%, MS2: 62% had considerable or strong participation), but they tended to have some participation in exchanging experience and insight on the use of IT in teaching with other schools/regions/countries when implementing school ITEd plans (MS1: 23%, MS2: 22% had considerable or strong participation).

The three major problems encountered often or most often by school heads in the implementation of ITEd plans in MS1 were lack of suitable educational software or digital resources (45%), insufficient assistive devices (36%) and teachers'/therapists' heavy workload (31%). No statistically significant difference was noted in MS2.

Activities to Promote IT Culture: School heads were satisfied with the collaborative team work and sharing among teachers in the use of IT for teaching in schools. In MS1, 45% of schools had organised sharing activities on the use of IT for teaching. Among them, 52% had organised the sharing activities with outside parties. Of these, 77% of them organised the activities with local schools. There was no statistically significant difference between MS1 and MS2 in this area.

Resources and Support: The measure of merging the various IT grants and providing flexibility on the use of grants effectively enhanced schools' flexibility to allocate resources to support school-based ITEd plans and accountability for results. A statistically significant increase was noted in the percentage of schools receiving funding from the Quality Education Fund for IT-related projects (from 51% to 78%) in MS2. School heads tended to be satisfied with the current funding model of the "Composite Information Technology Grant" (CITG) provided by the EMB to support ITEd and ITEd Team Teachers were quite satisfied (一般) with this model (school heads=MS1: 53%, MS2: 48%; and ITEd Team teachers=MS1: 25%, MS2: 16% were satisfied or very satisfied with the funding model). No statistically significant difference was identified in MS2

School Professional Development in ITEd for School Heads: The measure to enhance school leadership by providing training on e-leadership and application of ITEd in professional development programmes for school heads was implemented. In MS1, 45% of the special school heads participated in ITEd professional development programmes or activities. Among them, 80% of school heads found the programmes or activities to be effective or very effective in helping their teaching, administration and managerial work. According to the surveyed school heads in MS1, the three most popular themes which should be included into ITEd professional development programmes or activities were using IT in school administration or managerial work (84%), using new technology in teaching (64%) and formulation of school-based ITEd plans (55%). As for the modes of professional development programmes or activities, the two most desirable modes rated by school heads were workshops (84%) and training courses (72%) in MS1. No statistically significant difference was noted in school heads' expectation of the themes in MS2 and a statistically significant decrease (from 84% to 65%) was observed in the mode of workshop in MS2.

School Heads' Willingness to Promote ITEd: In MS1, majority of the special school heads (87%) were willing or very willing to allocate more time for the promotion of ITEd in schools. No statistically significant difference was identified in MS2.

8.8.4 Strategic Goal 4 Enriching Digital Resources for Learning

School Heads' Perception of Enriching Digital Resources for Learning: In MS1, 77% of school heads were satisfied or very satisfied with the acquisition of up-to-date digital resources for teachers' and students' use. 50% of them were satisfied or very satisfied that their schools derived an effective digital resource management mechanism to facilitate learning and teaching as well as sharing among teachers, parents and students. 41% of them were satisfied or very satisfied that their schools developed quality school-based digital resources and a repository of on-line resources for all KLAs. No statistically significant difference was found in school heads' level of satisfaction with all the aspects related to enriching digital resources for learning in MS2.

Sources of Digital Resources: School heads considered the digital resources produced by teachers/therapists and the free digital resources downloaded from the Internet (except the HKEdCity) as the two most important sources. The two most common digital resources which NC teachers used frequently or very frequently were those purchased by their schools and those provided by textbook publishers whereas ID teachers used those developed by themselves and schools frequently or very frequently.

Teachers and students tended to perceive that the digital resources were helpful for students' learning, no matter they were assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours (NC teachers=MS1: 64%,

MS2 50%; ID teachers=MS1: 53%, MS2: 50%; NC students=MS1: 46%-58%, MS2: 54%-58%; and ID students= MS1: 59%-70%, MS2: 75%-86% rated these resources as helpful or definitely helpful). No statistically significant difference was noted for NC teachers in MS2.

Students tended to consider digital resources in schools as sufficient to meet their needs whereas NC teachers in both MS1 and MS2 as well as ID teachers in MS1 considered them as quite sufficient (一般). ID teachers in MS2 considered them as sufficient. (NC teachers=MS1: 27%, MS2: 31%; ID teachers=MS1: 39%, MS2: 63%; NC students=MS1: 45%, MS2: 43%; and ID students=MS1: 58%; MS2: 28% considered the resources as sufficient or very sufficient). No statistically significant difference was noted for NC teachers and NC students in MS2.

Lack of suitable digital resources was one of the major problems that schools encountered when implementing school ITEd plans as perceived by school heads. As reported by the ITEd team teachers, the second greatest support needed by the special schools was increasing or upgrading digital resources. 78% and 80% of them in MS1 and MS2 respectively indicated that they were quite in need or much in need of this support.

Digital Resources Repository: 17% and 43% of NC and ID teachers as well as 58% and 38% of NC and ID students respectively used e-learning platforms for teaching or learning in MS1. 23% and 31% of NC and ID teachers as well as 41% and 27% of NC and ID students respectively used the platforms for the same purposes in MS2. Of these, 58% of students as well as 65% and 81% of NC and ID teachers respectively visited school e-learning platforms 1 to 10 times during the week prior to the conduct of the questionnaire survey in MS1. 73% and 63% of NC and ID students as well as 70% and 73% of NC and ID teachers respectively visited school e-learning platforms 1 to 10 times in MS2. A statistically significant decrease was noted in the percentage of NC students using school e-learning platforms while an increase was observed in their frequency of the usage in MS2. No statistically significant difference was noted in the usage by teachers. Students and teachers generally agreed that e-learning platforms could help students' learning (NC teachers=MS1: 27%, MS2: 22%; ID teachers=MS1: 34%, MS2: 25%; NC students=MS1: 45%, MS2: 49%; and ID students=MS1: 59%; MS2: 31% agreed or strongly agreed to this statement). No statistically significant difference was noted for NC teachers and students in MS2.

As for the usage of the HKEdCity, 33% and 39% of NC and ID students as well as 69% and 74% of NC and ID teachers respectively visited the HKEdCity in MS1. 54% and 62% of NC and ID students as well as 82% and 71% of NC and ID teachers respectively visited the HKEdCity in MS2. A statistically significant increase was noted in the percentages of NC teachers and students having visited this website in MS2. Regarding the learning effectiveness of the HKEdCity, teachers and students tended to perceive the HKEdCity to be effective in assisting students' learning while parents perceived this website to be quite effective (一般) (NC teachers= MS1: 55%, MS2: 43%; ID teachers= MS1: 45%, MS2: 41%; NC students=MS1: 53%, MS2: 44%; ID students=MS1: 65%, MS2: 27%; NC parents=MS1: 30%, MS2: 24%; and ID parents=MS1: 44%, MS2: 21% considered this website as effective or very effective in assisting students' learning). Teachers and students tended to perceive that the learning materials provided by the HKEdCity were suitable for students, except ID students in MS1 who perceived a higher level of suitability (NC teachers=MS1: 51%, MS2: 41%; ID teachers=MS1: 49%, MS2: 45%; NC students=MS1: 54%, MS2: 41%; and ID students=MS1: 71%, MS2: 27% considered the learning materials as suitable or very suitable). No statistically significant difference was noted for NC teachers and students in MS2.

8.8.5 Strategic Goal 5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

Access and Connectivity in Schools: School heads were satisfied that their schools provided sound and sufficient IT facilities for students and teachers/therapists. Hardware was improved in special schools. A statistically significant increase was noted in the percentage of schools having at least 1 wireless LAN in schools (from 43% to 75%) in MS2. On average, the numbers of digital projectors for mobile use and that for fixed installation were 2.81 and 10.03 respectively in MS1. There was an average of 5.65 digital projectors (including LCD projectors) installed in 11.19 general classrooms in MS1. As for the provision of computers in special schools, the numbers of desktop and notebook computers per school were 68.28 and 11.56 respectively in MS1. The student-to-computer gross ratio (including all computers in school), student-to-computer net ratio (excluding computers in staff rooms and general office) and teacher-to-computer ratio (computers in staff rooms) were 1.74:1, 2.24:1 and 3.00:1 respectively. The majority of computers in special schools were located in special rooms. There was at least one computer installed in each general classroom (an average of 14 computers including desktop and notebook located in an average of 11.19 general classrooms per special school in MS1). No statistically significant difference was noted in MS2.

As for the adequacy of IT facilities in schools, students perceived a higher level of sufficiency than that of teachers on school IT facilities to meet students' needs. ID teachers as well as ID and NC students tended to perceive the IT facilities in schools as sufficient to meet their teaching or learning needs (ID teachers=MS1: 49%, MS2: 51%; NC students=MS1=MS2: 49%; and ID students=MS1: 62%, MS2: 75% rated these as sufficient or very sufficient to meet their teaching or learning needs). A statistically significant increase was noted in NC teachers' perceived level of sufficiency to meet their teaching needs (from 27% to 40%) in MS2. As for the adequacy of assistive devices when using IT facilities in schools, both ID and NC teachers in MS1 and MS2 perceived the assistive devices in schools as quite sufficient (一般) to meet students' needs (NC teachers=MS1=MS2: 33%; and ID teachers=MS1=MS2: 27% rated such devices as sufficient or very sufficient). NC and ID students in MS1 perceived a higher level of sufficiency of such devices in school (NC students=MS1: 70%; ID students=MS1: 63%). The lowest rating was indicated by ID-S students and H teachers in MS1 as well as ID-Mod students and teachers in MS2.

The School ITEd Survey showed that 100% and 96% of special schools had connection to the Internet through broadband in MS1 and MS2 respectively. No statistically significant difference was noted in MS2. A statistically significant increase was identified in the percentages of schools having a connection speed of 10Mbps or higher (from 24% to 40%) in MS2. 100% and 95% of schools had school websites in MS1 and MS2 respectively. 82% and 87% of schools respectively had school intranets in MS1 and MS2. A statistically significant increase was noted in the percentage of schools with e-learning platforms (from 33% to 53%) in MS2. Teachers and students tended to be satisfied with the speed of Internet connection in schools, except for NC teachers in MS1 who perceived a lower level of satisfaction with this aspect (ID students=MS1: 55%, MS2: 70%; ID teachers=MS1: 57%, MS2: 63%; NC students=MS1: 48%, MS2: 51%; and NC teachers=MS1: 40%, MS2: 52% were satisfied or very satisfied). A statistically significant increase was noted for NC teachers in this aspect in MS2.

79% of special schools had opened computer rooms for students after school in MS1 and MS2. NC students considered the opening hours of computer rooms beyond school hours as quite sufficient (一般) while ID students tended to perceive such service as sufficient (NC students=MS1: 42%, MS2: 31%; and ID students=MS1: 66%, MS2: 51% rated such facilities as sufficient or very sufficient). No statistically significant difference was noted for NC students in

this aspect in MS2.

Management and Maintenance of IT Facilities and Technical Support Services: Regarding technical support services, students perceived that it was quite easy (一般) to get such support when encountering technical problems in using computers, except ID students in MS2 who perceived a lower level of easiness to get such support (NC students=MS1=MS2: 32%; and ID students=MS1: 20%, MS2: 15% rated easy or very easy to get such support). With regard to the channels from which the teachers could seek technical support, teachers considered the technical support provided by IT technicians in schools as the most satisfactory channel (NC teachers=MS1: 72%, MS2: 64%; and ID teachers=MS1: 73%, MS2: 76% were satisfied or very satisfied). No statistically significant difference was noted for NC students and teachers in MS2.

Upgrading IT Facilities and Exploring Advanced IT Technology: Students perceived a higher level of sufficiency on IT infrastructure than that of teachers to meet their needs (NC students=MS1=MS2: 51%; NC teachers=MS1: 28%, MS2: 30%; ID students=MS1: 56%, MS2: 75%; and ID teachers=MS1: 40%, MS2: 46% rated such infrastructure as sufficient or very sufficient). No statistically significant difference was identified for NC teachers and students in this aspect in MS2. School heads were concerned about both conventional technologies and the advanced ones. In MS1, they indicated that IT infrastructure should be further consolidated by upgrading IT facilities. Computers and projectors in classrooms (62%), e-learning platforms (48%) and assistive devices (35%) were the three most needed IT facilities or services which should be upgraded to provide an environment conducive to ITEd/therapy or training in special schools. No statistically significant difference was found in this aspect in MS2.

Teachers perceived the advanced IT facilities such as wireless network system in schools to be quite sufficient (一般) to promote innovative teaching pedagogy, except ID teachers in MS2 who perceived a higher level of sufficiency in this aspect. (NC teachers=MS1: 30%, MS2: 37%; and ID teachers=MS1: 34%, MS2: 44% rated these facilities as sufficient or very sufficient). No statistically significant difference was noted for NC teachers in MS2. School heads perceived e-learning platforms (50%), computers and projectors in classrooms (48%) and mobile learning devices (38%) as the top three priorities for additional IT facilities or services which were needed for students' and teachers'/therapists' use in special schools in MS1. No statistically significant difference was found in this aspect in MS2.

8.8.6 Strategic Goal 6 Providing Continuous Research and Development

School Heads' Perception of Continuous Research and Development in ITEd: In MS1, 37% of school heads were satisfied or very satisfied that their schools actively studied or evaluated the effectiveness of some innovative IT pedagogical strategies and shared the experience with the education community. Same percentage of school heads indicated that they were satisfied or very satisfied with their schools' active participation in pilot projects or pilot schemes on teaching so as to explore the effectiveness of the innovative use of IT for learning and teaching enhancement. 17% of them were satisfied or very satisfied that the EMB could share the results of these projects with schools in order to assist them in the promotion of ITEd. No statistically significant difference was noted in these three listed outcomes in MS2.

School ITEd Innovation: 27% of schools had launched pilot schemes or projects on the use of IT for teaching in the 2004/05 school year in MS1. Of the projects which the schools had joined with other organisations, 56% of schools collaborated with local tertiary institutions, 33% with the EMB, 33% with local primary, secondary and special schools. 22% of schools collaborated with local community or commercial organisations. No statistically significant difference was noted in the percentage of schools that had participated in the pilot schemes on the use of IT for teaching in MS2. When implementing school ITEd plans, ITEd Team teachers perceived that they had some participation in exploring new technology as well as researching and evaluating the effectiveness of ITEd in schools. 31% and 45% of the ITEd team teachers in MS1 and MS2 respectively perceived that they had considerable or strong participation in exploring new technology such as wireless system and developing innovative teaching methods. 36% and 48% of them in MS1 and MS2 respectively perceived that they had considerable or strong participation in performing research and evaluation on the effectiveness of ITEd in schools.

Regarding the usefulness of the support and resources from the EMB in developing teachers' ability in using IT for teaching, such as sharing the results of research-based projects with schools, teachers generally expressed a neutral(一般) attitude towards this aspect (NC teachers=MS1: 19%, MS2: 20%; and ID teachers=MS1: 20%, MS2: 19% agreed to this statement).

8.8.7 Strategic Goal 7 Promoting Community–wide Support and Community Building

Home-school Collaboration and Parents' Involvement: School heads were quite satisfied (一般) with their schools setting up concrete programmes to encourage parents' involvement in ITEd (30% of them were satisfied or very satisfied with this aspect in MS1 and no statistically significant difference was noted in MS2). Special schools or the Parent-Teacher Associations in schools actively organised or carried out different home-school collaboration activities or measures in MS1: encouraging parents to understand the situation in schools through visiting the school websites or intranet (91%), providing ITEd activities for parents (70%), explaining the work of ITEd in schools to parents (52%) as well as encouraging parents to instill proper principles, values and attitude in the use of IT into their children (50%). The percentage of schools that had taken the measures to encourage parents to instill the proper principles, values and attitude in the use of IT into their children significantly increased statistically from 50% in MS1 to 77% in MS2. Regarding the sufficiency of these programmes or activities, parents perceived that ITEd programmes or activities organised by schools for parents were quite sufficient (一般), except NC parents in MS1 who perceived a higher level of sufficiency in this aspect [NC parents=MS1: 33% (n=1), MS2: 20% (n=4); ID parents=MS1: 21% (n=3), MS2: 12% (n=2)].

Regarding the home-school communication with e-learning platforms, responses from relevant stakeholders revealed that e-learning platform was still not a common means of communication amongst parents, teachers and schools. 51% (n=4) and 30% (n=10) of NC as well as 34% (n=10) and 33% (n=10) of ID parents in MS1 and MS2 respectively agreed or strongly agreed that schools could effectively use e-learning platforms to promote their communication with schools and teachers. 35% of NC teachers in both MS1 and MS2 as well as 48% and 44% of ID teachers in MS1 and MS2 respectively expressed that they were willing or very willing to make use of these platforms to communicate with parents. Nonetheless, 93% and 85% of NC as well as 76% and 84% of ID teachers in MS1 and MS2 respectively rarely or never used e-learning platforms for this purpose.

Parental support was essential for students' learning with IT. 83% and 93% of NC as well 92% and 88% of ID parents in MS1 and MS2 respectively reported that they had computers at home. Amongst them, 84% and 91% of NC as well as 89% and 85% of ID parents in MS1 and MS2 respectively indicated having access to the Internet. Amongst those with the Internet access, all NC and 90% of ID families in MS1 as well as 90% of NC and 83% of ID families in MS2 had broadband connection at home. Students tended to perceive the IT facilities at home as sufficient and they tended to be satisfied with the speed of Internet connection at home, except ID student in MS2 who perceived a lower level of satisfaction with this aspect. Students perceived the assistive devices at home as quite sufficient (一般) except ID students in MS1 who perceived a higher level of sufficiency in this aspect. Parents indicated a lower level of sufficiency than students in this aspect. The lowest rating was indicated by VI parents, VI and ID-S students in MS1 as well as ID-Mod students and ID-S parents in MS2. The two most common types of parental support were allowing their children to attend IT courses (NC parents=MS1: 45%, MS2: 25%; ID parents=MS1: 20%, MS2: 36%) and encouraging their children to make use of community resources such as computer facilities in community centres and digital resources in libraries (NC parents=MS1: 34%, MS2: 31%; ID parents=MS1: 28%, MS2: 45%).

Community-wide Involvement: Community-school collaboration was still not very common. In MS1, out of the 14 special schools which launched pilot projects on the use of IT for teaching, around two-thirds of the schools (64%) had collaborated with other organisations. 56% of them collaborated with "local tertiary institutions", followed by the "EMB" (33%), "local primary, secondary and special schools" (33%) as well as "local community or commercial organisations" (22%) in the 2004/05 school year. Out of the 25 special schools which had launched sharing activities on the use of IT for teaching, 52% of them had collaborated with other organisations in the 2004/05 school year. 77% of the special schools most often collaborated with "local primary, secondary and special schools". No statistically significant difference was found in the percentages of schools organising collaboration activities with other organisations in MS2.

Special school heads tended to perceive that the EMB made significant contributions to school development in ITEd. In MS1, most of school heads (88%) perceived that the EMB made considerable or significant contributions of the provision of IT facilities and digital resources to school development in ITEd. Less than half of them thought that the "Internet service providers" (46%), "software or hardware service providers" (41%), "IT application system developers" (40%) and "local primary, secondary and special schools" (36%) made considerable or significant contributions. Lower percentages of school heads considered that "professional education organisations" (24%), "tertiary institutions" (19%), "other government policy departments or bureau" (12%) and "community organisations or centres" (11%) made considerable or significant contributions. No statistically significant difference was found in MS2.

With respect to community resources, the HKEdCity was considered by 48% and 42% of the ITEd team teachers in MS1 and MS2 respectively as the organisation having provided sufficient IT facilities or resources to schools. 33% and 39% of school heads as well as 10% of the ITEd team

teachers respectively in MS1 and in MS2 perceived the provision of community IT facilities or resources as sufficient or very sufficient. As for the usage of community IT facilities, more students reported using computers in public libraries than in community centres or youth centres. No statistically significant difference was observed in MS2.

Digital Divide: The problem of digital divide still existed. Although home computers were quite widely available for special school students in the low income group (families with monthly income below $10,000), it was noteworthy that Internet access was not available to all of them. 78% of families in the low income group had Internet access at home in both MS1 and MS2. Amongst those with Internet access at home, 11% of them had dial-up connection in both MS1 and MS2. The relatively low Internet connection speed would hinder the learning efficiency of students in using digital resources from the Internet.

Many measures were implemented to address the 'digital divide'. Special schools carried out measures to help needy students to use IT in their learning after school. The measure to continually extend the opening hours of school computer facilities to help students in need to access computers after school hours was implemented to a great extent. In MS1, 79% of schools opened computer rooms for students' use after school. 61% of schools had portable computers loaned to needy students for use at home. The measures to encourage computer recycling and donations to help needy students to bridge the digital divide were also progressively implemented. 52% of schools had students' application for computers (including recycled computers) from related organisations and 18% called for donation or recycled computers from parents or students in MS1. A statistically significant increase was noted in the percentage of schools having called for donation or recycled computers from parents or students (from 18% to 37%) in MS2.

Chapter 9 Major Findings from the Community Group Interviews

Focus group interviews were conducted with representatives from 9 selected organisations in the Community Group [2 IT-related organisations (including 1 organisation which mainly comprised of students from senior secondary class levels), 3 non-governmental organisations (NGOs) (including 2 organisations which mainly comprised of teachers and 1 organisation which mainly comprised of parents), 2 publishers and 2 tertiary institutions].

The purpose of the focus group interview was to find out the answers to research question 3, i.e. "How has the Community Group (tertiary institutions, publishers, IT-related organisations and NGOs) been involved in the implementation of the 'Empowering Learning and Teaching with Information Technology' Strategy (Second ITEd Strategy)?" by collecting information on:

a. the contribution of these organisations towards ITEd in Hong Kong;
b. the goal(s) and role(s) of these organisations in promoting ITEd (if they had planned for any contribution to ITEd);
c. the relevant projects and activities that had been or would be implemented by the organisation since the launch of the Second ITEd Strategy. These projects comprised of research activities, workshops, seminars, competitions and provision of resources to schools, teachers, students and parents; and
d. opinions or suggestions from these organisations regarding the implementation of ITEd in Hong Kong.

9.1 Contributions of the Community Group towards ITEd in Hong Kong

Contributions had been made by the Community Group to the implementation of ITEd in various areas according to the goals and roles of the organisations. Tertiary institutions emphasized on research and development of ITEd. Publishers focused on the promotion of web-based learning platforms in the future whereas IT-related organisations focused on teachers' training and students' activities. NGOs continuously provided activities for students and parents as well as training and sharing platforms for teachers. NGOs acted as a platform to develop network which connected different parties — schools, teachers, students, parents, the business sector and the Government. Contributions made by the Community Group are summarised in the following four areas:

- Providing various learning activities for students
- Providing training and collaboration opportunities for teachers
- Developing digital resources for schools
- Conducting projects on ITEd by tertiary institutions

Providing various learning activities for students

Different kinds of learning activities and courses were held by the Community Group for students. Many activities / schemes were held by tertiary institutions, IT-related organisations and NGOs to introduce and promote the use of IT to students. Some examples are given as follows:

- "Learning with fun" aimed at helping students to apply IT in learning and mastering the essential project-based learning skills.
- "Web care campaign 網絡無障礙" was designed to:
  - develop students' IT skills so as to teach their parents and elderly people to use computers; and
  - encourage self-learning of computer skills by students and parents.
- "HK Olympiad in Informatics 香港電腦奧林匹克" – aimed to develop problem-solving techniques and programming skills of students through software design.
- "Electronic Designing Competition 電子設計比賽" and "Project-based Learning 專題研習" - aimed to encourage students to make use of IT.
- "IT Winter Camp" and "IT Summer Camp" – aimed to consolidate the subject knowledge of students and foster their communication skills and creativity through collaboration.
- "18 Districts Youth IT Elite Training Programme 18 區青少年 IT 精英培訓計劃" – aimed to stimulate students' interest and potential on IT.
- IT awarding schemes, such as "Young IT Ambassador Award / IT Challenge Award" – aimed at motivating students' self-learning of IT.
- "Opensource Community Leader Scheme 開源社區領袖計劃" – aimed at training student leaders to promote the use of IT in community.

Providing training and collaboration opportunities for teachers

The Community Group provided teachers with up-to-date IT information. Workshops and seminars, which covered a wide range of IT-related topics, were held from time to time by many organisations in order to improve teachers' skills relating to e-learning and using IT tools such as e-books. Some newsletters not only contained the latest IT information, but also the current concerns about ITEd and the sharing of experiences from teachers. A sharing platform for teachers was also noted to be developed by professional organizations in which there was a special interest group held regularly for all teachers aiming to promote communication and exchange experiences in the use of IT in learning and teaching among teachers. Difficulties in using IT were also discussed.

Plenty of training opportunities were offered to teachers. The NGOs which mainly comprised of teachers provided opportunities for teachers to share their teaching experiences via a number of workshops and seminars on specific IT topics. As indicated by some interviewees, most of the practising teachers welcomed such kind of seminars and conferences. This helped teachers to overcome any difficulties encountered when facing the changes in teaching culture.

Refresher Training Courses were introduced by the Government and some of the courses were provided by tertiary institutions and the NGOs which mainly comprised of teachers. Furthermore, "Train-the-Trainer" was a scheme introduced by the Government to equip teachers with relevant knowledge in implementing ITEd in their schools. Similarly, the master programmes provided by universities also aimed to provide advanced training for teachers and help them to gain in-depth knowledge and practical skills, as claimed by the representatives of tertiary institutions.

Developing digital resources for schools

The Community Group developed various kinds of digital resources for both teachers and students. The support mainly came from tertiary institutions, publishers and NGOs.

Many projects of the tertiary institutions contributed to the development of digital resources with innovative pedagogy. For example, "Virtual Interactive Student-Oriented Learning Environment" was a web-based learning platform developed by two tertiary institutions for students. In order to attract students to use this platform, learning schemes were introduced on the platform through playing interesting online games so that users could apply their IT skills and knowledge while playing these games. "WebQuest 探索網站" was another project-based learning resources developed by the tertiary institution aiming to enhance the information-processing skills of students. Suggestions on how to use IT effectively in project-based learning were also provided. There had already been more than 500 cases of using "WebQuest" as teaching materials ranged from primary four to secondary seven. Its popularity was increasing.

Publishers developed e-learning platforms and other learning and teaching resources for teachers and students, including e-books, online exercises, website and other electronic materials as well as learning management system. Some other projects, such as the "Opensource Farm Project 開源園丁工程計劃", were carried out by NGOs. Sets of Linux Live CD were produced to promote the use of IT as well as the advantages of opensource software.

Professional organisations provided technical support and many digital resources including software and websites to schools. They acted as a medium between the software developers and schools, providing up-to-date information and striving for discounts in purchasing software for schools. Publishers also provided e-learning platforms and digital resources for learning activities with the use of textbooks.

Conducting projects on ITEd by tertiary institutions

The Community Group, especially the tertiary institutions, contributed to the community by conducting projects on ITEd. These projects mainly focused on pedagogical innovation, sharing culture and professional development on ITEd.

Some research projects done by tertiary institutions are described below:

Virtual Interactive Student-Oriented Learning Environment (VISOLE): VISOLE was a learning style that combined scaffolding and the use of virtual games for in-depth learning. Users needed to apply the knowledge accrued from different scaffolding stages to solve problems. VISOLE also helped users to develop the communication and problem-solving skills. "Tong Pak Fu and Chou Heung 唐伯虎點秋香" and "Farmtasia" were two major educational games developed under this scheme.

WebQuest: The two targets for this project were students and teachers. The aim of this project was to make an improvement in the ability of students to process information collected from the net. It also provided information for teachers from the design to teaching and evaluating the effectiveness of integrating pedagogy with IT.

3I (Interdisciplinary, Inter-school and International) Project Learning: 3I Project demonstrated a new learning mode - web-based learning using a new teaching method. Participants would share some common objectives, investigate issues and share what they had learnt from others in the community, thus promoted a sharing culture at the same time.

Good Practices on IT in Education Interactive Platform: This project built a community to share successful examples with regard to using online databases and practising innovative pedagogy. Teachers were able to share their own experiences on the platform as well.

Scalable Network of Knowledge Building Schools: This project promoted and enhanced lifelong-learning capacities of students by providing support in integrating computer-supported collaborative knowledge-building activities in school curriculum. It also aimed to build an international collaborative learning network that enabled teachers and students to interact with their counterparts around the world and to participate in collaborative knowledge-building activities.

E-Leadership Training Courses: The project was specially designed for the school heads and vice-principals to try to improve their leadership skills. The impact of the courses on stimulating changes in schools was evaluated as well.

Other works including "ITEd studio 2006", "Innovative Pedagogical Practices Online Project" and "Learning Community Project" were also organised by the tertiary institutions.

9.2 Opinions and Suggestions Regarding the Implementation of ITEd in Hong Kong

Opinions and suggestions regarding the implementation of ITEd in Hong Kong are summarised in the following sections according to the seven strategic goals.

Strategic Goal 1 Empowering Learners with IT

As expressed by the representatives of the publishers, in general, the most concerned issue was the ability of students to use IT and their attitude towards using IT. Secondary school students were believed to have stronger motivation than primary school students in using IT but the motivation of students in this area was still considered to be weak.

Majority of the representatives had the impression that students were capable of using software and they were IT competent especially in the area of entertainment; however, they were weak in the concept and applications of IT and Information Literacy. There was a concern about the way that students used information collected from the Internet. Moreover, most of them lacked certain fundamental skills, e.g. Chinese inputting, which was essential for developing advanced IT skills as well as generic competencies. Some students might not have as many opportunities as their peers in using IT outside school due to the economical status and / or educational background of their families. Hence, there was a large discrepancy of IT proficiency among students. One could not provide a definite conclusive standardized assessment framework in present times. Nevertheless, the overall IT competency of students had improved.

One of the purposes of ITEd was to provide an environment to encourage students to learn by themselves and to foster creative thinking. However, over-emphasis on assessment, examination and subject-based learning hindered the development of students. The IT curriculum was considered to be too superficial, abstract and impractical for real life environment, as claimed by the representatives of IT-related organisation for senior form students. These students expressed that there was a repetition of content in the IT curriculum for primary and secondary schools. Lack of opportunities for project-based learning especially for senior secondary school students was observed. Representatives of the NGOs which mainly comprised of teachers pointed out that the value of the IT subject should not be ignored as our students were required to master the skills and

knowledge of the ever changing technologies that were highly related to their living. The representatives of publishers commented that ITEd in Hong Kong over-focused on multimedia learning instead of web-based learning, which was an important IT development to enhance student's learning. They suggested that the Government should promote the use of innovative learning environment which could allow students to have more opportunities to develop their own thinking. The Government should encourage the use of IT in learning by giving rewards to innovative measures and projects as well as promoting the use of entertaining elements in learning.

Strategic Goal 2 Empowering Teachers with IT

Teachers were motivators and facilitators in the development of ITEd. Representatives of IT-related organisations, publishers and the NGOs which mainly comprised of teachers and publishers believed that most teachers realised the advantages of IT in learning and teaching. However, not many teachers were willing to put IT into pedagogical practices because a lot of time was required to prepare teaching materials using IT and to keep oneself up-to-date with the ever-changing IT world. Great effort was also needed to change the current pedagogical practice to the one that suited the goals of ITEd. Heavy workloads discouraged most of the teachers from doing so. Owing to the lack of enthusiasm and motivation, teachers became the greatest resistance in putting ITEd into practice. Yet, improvements had been made in several aspects since the promotion of ITEd. For instance, teachers were getting used to changes in teaching culture and there was an increase in the use of e-mail as a communication tool in school. In addition, more teachers were making use of the school homepages and IT knowledge of teachers had also improved.

With the development of ITEd, the most important change in teaching method would be from "chalk and talk" to encouraging knowledge building by learners themselves. Much attention was put on how pedagogy should be integrated with the use of IT. The representatives expressed that teaching method using IT should be creative, flexible and practical. However, in reality, many teachers showed their incompetence in this aspect as they still mainly focused on skills and knowledge of IT rather than integrating it into students' learning. Furthermore, teachers indicated that although the Learning Management System was installed in quite a number of schools, it was under-used.

Many representatives of the Community Group indicated that the development of ITEd had brought about a massive change in pedagogy which inevitably increased the workload of teachers. The lack of sharing of teaching resources implied that most teachers had to prepare their own teaching materials which required a lot of time. Provision of sufficient aids and resources as well as reducing workloads would make it easier for teachers to adapt to the changes. They suggested that continuous training of teachers would be important for the teachers to adapt to the changes of teaching culture. Training of teachers should aim at promoting the integration of IT into pedagogy. Training offered in the past few years emphasised on the skills of using IT which might not be appropriate anymore. Focus should now be put on meaningful use of information. Moreover, teachers would be motivated if their achievement in mastering IT skills and their pedagogical knowledge in IT was recognized. Voluntary certification system and IT awarding scheme could serve this purpose by recognizing the IT competence and commitment of teachers who had received training, as mentioned by the IT-related organisations and the NGO which mainly comprised of teachers.

Strategic Goal 3 Enhancing School Leadership for the Knowledge Age

Successful implementation of ITEd varies among schools, depending on school leadership and whether they are able to identify the direction in developing ITEd. Some schools use their IT infrastructure for administration instead of learning and teaching. As a result, ITEd implementation may not be successful despite the adequate IT facilities in schools.

Most representatives of all interviewed organisations expressed that the Government did well in assisting schools for building well-equipped infrastructure for ITEd. However, some of them commented that as there was a lack of explicit requirement and direction in putting the ITEd policy into school practice from the Government. Some schools still could not recognise the value of integrating IT into learning and teaching. Also, because of the large scale and rapidly changing education reform, schools tended to focus on the most recent concerns such as language education and curriculum reform only. Some school heads perceived ITEd as one of the items in the agenda of education reform by the Government and not as something which they would like to put in efforts. Once the minimum requirement was met, their attention would be shifted to other areas. It was perhaps one of the reasons of the slow development of ITEd in Hong Kong as claimed by some of the representatives.

Another reason cited by the representatives of IT-related organisation and the NGOs which mainly comprised of teachers that might account for the difficulties in implementing ITEd was the problem of linkage between the existing IT subject and the other learning subjects in the school curriculum. Having said so, it did not mean that IT should not be taken as a separate subject but it should be emphasised that IT could be appropriately used across all subjects. In fact, to keep up with the pace of the ever-changing information society, continuous learning about IT was needed to provide students with the latest IT knowledge and skills. Therefore, careful design of IT curriculum was required and clear guidelines on the teaching of different IT skills would be helpful.

The representatives of IT-related organisations and the NGOs which mainly comprised of teachers also stated that sharing culture was of great importance in helping to overcome the difficulties in ITEd development and to allow for improvements to be made. They suggested that the Government should further promote the sharing of digital teaching resources in order to develop a culture of collective contribution and collective benefit. Schools that were well-developed in ITEd, e.g. Learning Centres, could act as models for others to follow. Learning Centres would be required to share and promote effective pedagogy related to the use of IT in learning and teaching. However, the connection between these Learning Centres and other schools was still weak and they seldom cooperated with each other. The demonstration of innovative pedagogy with the use of IT by the Learning Centres was not enough as expressed by the representatives of the NGOs which mainly comprised of teachers. On the other hand, other organisations in the Community Group were enthusiastic about it. They had attempted to expand the use of IT through promoting interflow projects, such as the "Online sister-school scheme 網上姊妹學校計劃" project of the NGO which mainly comprised of teachers between schools in Hong Kong and Mainland China.

Despite the works that had been done to promote the sharing culture, sharing of information amongst schools was still considered as inadequate. This inadequacy, in fact, became one of the obstructions in the ITEd development in Hong Kong. Some representatives suggested that the Government should set up another fund to support those who followed the good practices in the use of IT for learning and teaching.

No matter how clear the direction of the ITEd policy is, the success of putting ITEd into practice also depends largely on the leadership of school heads and ITEd teams. Some training courses and

other programmes in the past were mainly offered to school heads or vice principals e.g. “Headmaster’s IT forum” and “e-Leadership Training Course”. The representatives of the NGOs which mainly comprised of teachers hoped that they could participate in such programmes.

Strategic Goal 4 Enriching Digital Resources for Learning

The establishment of the HKEdCity is one of the achievements in ITEd. It is a digital resources repository which centralises digital resources and provides a platform for information sharing. Promotion is important to let people know what is available for them, so that they can benefit from the resources. The representatives of the Community Group expressed that due to the lack of promotion, the website was not widely used even though it was well designed.

Price of the resources was another factor which discouraged schools from using them even if they were essential. For instance, schools had to pay a large amount of money like for the license fee of some software (e.g. web design software) needed for teaching which they could not afford. The representatives of IT-related organisations and NGOs suggested that the Government should help by bargaining for an affordable price, purchasing license (site license) for schools in bulk and setting up a benchmark for quality digital resources.

Strategic Goal 5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

Funds provided by the Government in setting up IT infrastructure in schools were believed to be sufficient and the hardware had been greatly improved. Representatives of all interviewed organisations appreciated the well-built IT infrastructure in schools. The representatives of the NGOs which mainly comprised of teachers considered that various support and services (e.g. support of IT coordinators to schools) as well as the flexible funding (e.g. CITG) given by the EMB were helpful to support schools in implementing ITEd.

On the other hand, some of the representatives suggested that additional funding was necessary. The representatives of tertiary institutions and the NGOs which mainly comprised of teachers believed that every teacher should have their own computer in schools for effective development of ITEd. Regular updating of the IT facilities was also necessary in order to support the rapid advancement of technology.

Although the IT infrastructure was well-built, it might not be fully utilized. There was an instance mentioned by the representatives of the NGOs which mainly comprised of teachers that some schools were still using some notebook computers that were not yet compatible with the wireless networks set up in the schools. They emphasized the need for upgrading the IT facilities.

Strategic Goal 6 Providing Continuous Research and Development

Various projects on ITEd had been conducted by tertiary institutions. These projects mainly focused on pedagogical innovation, sharing culture and ITEd professional development for teachers and school heads. Representatives from the tertiary institutions stated that continuous research should be implemented in these areas in the use of IT.

Strategic Goal 7 Promoting Community–wide Support and Community Building

Parents were believed to have considerable influences on students in using IT for learning. Their support mainly depended on their IT knowledge. Working parents would be more likely to have a better understanding of IT. Those who were less familiar with IT probably did not understand the benefit of using it and they usually mistook computer as an entertainment tool for playing online games only and thus tended to discourage their children from using it.

As a result, the NGO which mainly comprised of parents was trying to encourage parents to learn more about IT; for example, getting them to use the Internet and computers as a communication tool. Talks were provided regarding IT concepts, such as BitTorrent[17], and Internet security. Various activities which suited the different needs of parents were held to promote the use of IT. Support also came from the business field. Starting from the 2005/06 school year, parents took a series of free computer courses sponsored by an IT firm for 2 years.

Support was given to those families who were unable to afford expensive computer hardware and software. For example, they could make use of the facilities provided within the community. Computer rooms in some schools were opened after school hours and loan services on computers were provided to those in need. However, these kinds of support were insufficient as expressed by the representatives of NGO for parents and IT-related organisation for students.

The representatives of the NGO which comprised of parents mentioned that Social Welfare Department provided recurrent subventions to NGOs and community centres which were subordinated to the Department. Although NGOs and community centres provided some IT-related programmes to the community, they were not given any direction in serving parents and in facilitating the education policy. Due to the provision of integrated services by the community centres, the governmental department had a close connection with the parents. The community centres also had well-equipped IT facilities and were experienced in organising activities for the community. The representatives of the NGO which mainly comprised of parents expressed that there were many restrictions when holding activities with schools. They lacked their own computer facilities and they had to hire venues for IT-related events from other organisations. As a result, they often co-organised these IT-related activities with other NGOs and various government departments. The representatives of the IT-related organisation for students also mentioned that they faced the same problem in sourcing manpower and financial support for their activities. Generally speaking, the NGOs were willing to take the initiative to coordinate various IT-related activities in different districts in Hong Kong.

[17] BitTorrent is a peer-assisted digital content delivery protocol that enables users to easily publish and download movies, music, games, entertainment media and any other kinds of files.

Chapter 10 Summary and Recommendations

This chapter gives an overall discussion of the major quantitative and qualitative findings in this study. The achievements of the Second ITEd Strategy and the issues that need to be addressed in the next stage of the ITEd implementation are summarised. A number of recommendations for future direction of ITEd in Hong Kong are proposed followed by the respective discussion.

10.1 Empowering Learners with IT

Both primary and secondary school heads were satisfied that their students could master requisite IT knowledge and apply basic concepts and skills at their related learning stages whereas special school heads indicated that they tended to be satisfied with this aspect. In general, primary and secondary school students were more proficient in using software for communication and information search purposes. They were also proficient in basic hardware operation and using hardware for entertainment. Students at upper primary class levels (i.e. P4 and P6) tended to be proficient in performing simple word processing, spreadsheet, graphic design and presentation using IT. However, they were less proficient in web design. Secondary school students tended to be proficient in performing Chinese input, word processing and presentation using IT. However, they were less proficient in using software to create spreadsheet, audio or video editing as well as web and multi-media design. Both primary and secondary school students were weak in mastering skills for new technology such as mobile devices. The findings showed that students were generally capable of using different types of software with different degree of proficiency. However, the fundamental skill, such as Chinese input which is essential for developing advanced IT skills as well as generic competencies is expected to be strengthened especially at the lower primary class levels. Students from special schools of Normal Curriculum (NC) showed similar level of proficiency in using software and hardware as the primary and secondary school students whereas the ID students rated themselves as not proficient.

This study revealed a trend of increase in the level of proficiency in communication and online searching skills from P4 to P6 students (from around 50% in P4 to around 70% in P6) and it kept steady among the secondary school students (the level of proficiency for S2 to S6 students ranged from 70% to 77%). This phenomenon was, perhaps, a result of the increased project-based learning activities in the primary schools. For secondary school students, especially those in senior forms, of which the curriculum was mostly examination-driven, the opportunities for them to engage in such activities were comparatively less than those of the primary school students. Moreover, the findings also revealed a declining level of proficiency from S2 to S6 students in using multimedia, networking and mobile devices as well as information processing and analysis tool such as spreadsheet. It may imply that although these tools are believed to be useful for the development of students' higher-order thinking and collaborative skills, relevant activities using such tools are still not common in the secondary school sector during the period of this study.

Regarding students' attitude towards the social and ethical issues of using IT, primary and secondary school heads perceived a higher satisfaction level than special school heads. The findings from the students illustrated that there was a reasonable level of awareness of social and ethical issues relating to the use of IT. Students of the primary and secondary school sectors as well as NC students showed greater concern about the issue of "beware of e-mail bombs or the spread of computer virus" (In MS2, a statistically significant increase was noted in the percentages of P4, P6, and S6 students who agreed or strongly agreed to this item whereas a statistically significant decrease was noted in those of S4 students.) and ID students were more concerned about "avoid spending long hours on computer or online games". However, they were less

concerned about the issue of "sending or forwarding unnecessary e-mails or messages" (A statistically significant increase was noted in the P4 students' level of agreement to this item in MS2.). Secondary school students even showed less concern about using pirated software. Such findings imply the need to strengthen the current ITEd curriculum[18] that incorporates the learning activities to address the ethical issues induced from the use of IT as suggested in the Information Literacy (IL) framework developed under the Second ITEd Strategy.

With respect to the attitude towards the use of IT for learning no matter in class or beyond school hours, most students in the three school sectors perceived it positively. Students liked to use computers for learning. In MS1, 79% to 96% of the primary and special school students liked to use computers for learning in class or beyond school hours. As for the secondary school sector, around 80% of the students indicated that they liked to use computers for learning in class while around 60% of them liked to use computers for learning beyond school hours. A statistically significant increase was noted in the percentages of P4, P6 and S6 students who liked using computers for learning in class. The percentage of secondary school students who liked using computers for learning beyond school hours significantly increased statistically in MS2. Such a positive perception is encouraging for empowering students' learning if they are given the proper opportunities of using IT in various learning activities.

Apart from the positive attitude towards using IT for learning, the perception or the belief regarding the impact of IT on students' learning is also influential to the effective use of IT for learning. Many proponents consider that the impact of IT is significant in assisting higher-order cognitive processes such as information-processing, problem-solving, analytical or critical thinking (Wilson, 1995; Edwards, 1995; Doiron & Davis, 1998; Liu, Macmillan & Timmons, 1998; Pedretti, Mayer-Smith & Woodrow, 1998; Rodrigues, 1997; MacGregor & Lou 2004). The teachers and students of the primary and secondary school sectors in this study perceived that IT had positive impact on learning, particularly in widening perspective through more interaction with the outside world, enhancing students' self-learning and interest in learning subject content as well as enhancing information-processing ability. However, their perceived levels of agreement to the impact of using IT to enhance students' collaboration, communication and creativity as well as planning and learning management skills were found to be lower, though still positive. The level of agreement to the outcome of enhancing students' communication and presentation skills was rated as the lowest, in particular for primary and secondary school students. It is argued that a positive perception towards the impact of IT on learning enhances students' and teachers' motivation in using IT for learning or teaching and thus helps the development of the higher-order thinking skills. However, it is seen from the findings that more work has to be done to change stakeholders' perception in this aspect.

While the provision of opportunities for using IT in learning is considered important for both knowledge construction and development of generic competencies, the provision of learning experiences for the students to learn about IT knowledge and skills is also regarded as essential as such knowledge and skills are the foundation for developing higher-order thinking skills through the use of IT for learning. This study showed an optimistic result in this aspect. Nearly all primary and special schools as well as majority of secondary schools offered Computer or IT subjects. The findings showed that primary and secondary schools closely followed the guidelines of Information Technology Learning Targets (CDC, 2000) in preparing learning and teaching activities to develop students' capability in using IT. Basic hardware operation skills were taught

[18] "School ITEd curriculum" refers to (a) the application of IT in learning and teaching of each KLA (including Computer Studies or IT curriculum) to develop IT skills, and (b) to foster the development of information literacy (information-processing skills and attitude) and generic skills (collaboration skills, communication skills, creativity, critical thinking skills, problem-solving skills, self-management skills, study skills, information technology skills and numeracy skills).

in lower primary class levels. Skills in using software for communication, word processing, presentation and web design were then developed in upper primary class levels. Information-processing skills and presentation skills were expected to be developed in lower secondary class levels. The achievements in the implementation of the above learning targets were well reflected by primary and secondary school students' perception of the level of proficiency in most of the basic software and hardware as mentioned above. For special school sector, NC students only perceived average level of proficiency in using presentation and web design software. Awareness of legal, social and ethical responsibilities in using IT was also emphasized in IT subjects. However, this study revealed a need to review the effectiveness of the current teaching practice that might have been insufficient to address the issues in the domain concerning the social and ethical issues relating to the use of IT. Moreover, as expressed by the representatives of a NGO which mainly comprised of secondary school students, there was a repetition of content in the IT curriculum for primary and secondary schools. Therefore, an investigation into this issue is expected.

This study showed that school heads of the primary and secondary school sectors were satisfied with students' IT knowledge and skills, but tended to be satisfied with students' ability to use IT for independent learning, information retrieval and evaluation as well as problem-solving in their daily lives and as a tool in their learning activities. The satisfaction levels of special school heads in these aspects were comparatively lower. Similarly, teachers perceived that students' competencies in the later areas were average. Students were capable of using some hardware and software, but they were not so good at using IT for higher-order learning like problem-solving, analysis, and decision-making etc. as stated in the IL framework. Such finding was also agreed by the representatives of the Community Group. This study showed that students had engaged in different types of learning activities with the use of IT. However, these activities were mainly confined to information search. Activities related to information selection, information collation and analysis, reporting and presentation as well as self-evaluation on learning outcomes were relatively less. It provides an answer to the result of relatively lower confidence level in performing the higher-order skills than information search as reported by the students. Despite the above findings, it was encouraging that more 'student-centred' activities which required the basic IL skill in information search were becoming popular. Such a phenomenon has not been obvious in the previous evaluation studies and is believed to pose a positive ground for further development of ITEd in the future.

Apart from the learning activities at school, the learning activities with the use of digital resources beyond school hours allow students to learn independently and to extend their learning opportunities according to individuals' learning needs and pace. This study showed that students from the three school sectors generally spent some time on learning-related activities with the use of digital resources beyond school hours (Amongst those students who spent time on learning-related activities with the use of digital resources beyond school hours, the majority of them indicated that they had used such resources 1 to 4 times during the week prior to the conduct of the questionnaire survey.). A statistically significant decrease was noted in the percentage of secondary school students who did so in MS2**.** The findings showed that higher percentages of the primary school students than the secondary school students used digital resources for learning beyond school hours. The learning activities for primary school students were often planned by the teachers. It is noteworthy that more after-school learning activities requiring the use of IT have been attempted. However, more guidance and opportunities of project-based learning especially for the secondary school students are necessary to attract their interest in self-learning as well as to create opportunities for their use of higher-order thinking skills in the learning tasks.

Recommendations

1. It is suggested that IT as a separate subject has its value in providing learning experiences for all students in acquiring the up-to-date knowledge about IT and in mastering the skills of using the latest technology. Such a suggestion is also supported by the representatives of the Community Group in this study. However, as the current guidelines of Information Technology Learning Targets (CDC, 2000) is not a mandatory document, there have been occasions of repetition of learning contents in IT curriculum in the primary and secondary schools. Hence, there is a need for investigating the content of IT curriculum in order to bridge the curriculum between Computer Awareness for primary schools and Computer Literacy for secondary schools.

2. The potential use of IT for learning to develop generic skills such as creativity, critical thinking and communication should be further explored. Through the use of IT as a learning tool in subject and project-based learning, students are able to develop generic and higher-order thinking skills that are the basic competences required in today's workforce. Furthermore, while to encourage more use of IT in student-centred learning activities is essential, to help our students to develop the literacy of a responsible user of IT is also crucial to their all-round development. Schools, therefore, need an overall plan on ITEd which lays a blue print and guidelines on the design of an ITEd curriculum that focuses on the provision of learning experiences about the IT knowledge, skills and ethical issues as well as cross-curricular learning experiences that emphasise the development of generic skills through the applications of IT knowledge and skills.

10.2 Empowering Teachers with IT

This study showed that most teachers in the three school sectors met the IT competency requirements (Au, Kong, Leung, Ng & Pun, 1999) as reported by the schools. Teachers were well trained and were capable of conducting teaching with IT through general applications of software and hardware. There was evidence of a statistically significant increase in the confidence level of primary school teachers in conducting higher level teaching activities such as nurturing students' capability in processing information, designing learning context to foster students' higher-order thinking capability, arranging small-group learning and building a student-centred learning environment with the use of digital resources. An increase was noted in the confidence level of secondary school teachers in selecting appropriate digital resources to conduct teaching whereas a decrease was noted for the NC teachers in MS2. Teachers perceived a higher level of agreement that their teaching could promote students' capability in information search, but they perceived a lower level of agreement that their teaching could promote students' capability in information collation and analysis as well as self-evaluation on learning outcomes. An increase in primary school teachers' level of agreement to these outcomes was also observed. Regarding the agreement on using IT for motivating students in the learning of subjects in the KLAs, a higher perceived level of agreement was revealed among the teachers in the three school sectors. Teachers also tended to agree that they had facilitated students to use IT in cross-curricular learning activities and had used IT to create a supportive learning environment for students' independent learning as well as to provide opportunities for students to work collaboratively. A significant increase was found in the level of agreement to these items by primary school teachers in MS2.

The above summary revealed that teachers were generally confident and ready to incorporate higher-order learning opportunities in their minds. However, further investigation in this study found some discrepancies between teachers' perception and their actual practice in the classrooms.

It was found that the teachers adopted IT frequently to support their teaching of a subject, for example, in language subjects in the three school sectors as well as in General Studies in primary and special schools. The actual classroom use of IT was still more related to expository teaching rather than students' individual use of computers or collaborative small-group learning focusing on higher-order thinking skills. Also, the use of electronic means for assessing or responding to students' learning performance was still not a common practice. Despite the above findings, it was pleased to note that considerable proportion of the teachers reported that they had requested their students to use IT for self-learning beyond school hours (Two-thirds of the primary and secondary school teachers as well as around half of NC and one-third of ID teachers in special schools assigned digital resources to students for learning subject knowledge beyond school hours.). Quite a number of them gave assignments that required the use of digital resources for learning the subject knowledge at home. The above findings imply a slight shift in the pedagogy in subject teaching as more after-school assignments using IT were observed. Although the evidence of the student-centred activities for higher-order or collaborative learning was not so apparent in this study, such a "starting" change further reflected that teachers had taken their first step for paradigm shift. However, such change is usually slow and requires conducive factors and environment (Cuban, 1988; Kozma, 2003). The examination-driven curriculum, inflexible timetable, heavy workload, unsuitable design of general classrooms for the use of IT in teaching and insufficient digital resources were the obstacles to the integration of IT in learning and teaching as perceived by teachers as well as the representatives of the Community Group in this study. Students' development in information processing, higher-order thinking and generic skills might be limited as teachers only used IT occasionally to design learning context to foster students' higher-order thinking capability and tended to arrange small-group learning occasionally in this study. There is still room for improvement in this aspect.

Regarding the teachers' professional development in ITEd, this study showed that the focus of professional development for teachers had been switched from IT skills to effective pedagogical use of IT to support KLA or subject learning. Teachers of the three school sectors tended to perceive that the current ITEd professional development programmes or activities were practical and the programmes could achieve positive outcomes in enhancing their IT proficiency and their capability in using IT for learning and teaching. However, they perceived the adequacy of these programmes as average only. The findings indicated that the use of new technology in teaching, such as Learning Management System and wireless network, as well as the applications of IT in subjects or cross-curricular teaching and project-based or cross-curricular learning were the three major themes that the teachers needed for ITEd professional development programmes or activities.

Recommendations

3. There is a continuous need for further professional development in ITEd for teachers. It is suggested that the future direction of such professional development activities should focus on the pedagogical use of IT which not only facilitates exploratory teaching, but also student-centred learning and perhaps, assessments as well as the teaching of social and ethical issues as revealed from this study.

4. At the school level, policy and measures to remove the obstacles identified in this study such as unfavourable curriculum design, timetabling, and workload distribution etc. should be made. Opportunities for sharing and exchanging experiences, observing and reflecting on good practices as well as collaborating in curriculum and pedagogical innovations among the education community should be given to the teachers.

10.3 Enhancing School Leadership for the Knowledge Age

The measures to enhance school leadership for the knowledge age seemed to be effective in providing guidance to school heads for establishing visions and goals as well as for building leadership teams appropriate for their school contexts in integrating IT into school plans, curricula as well as learning and teaching processes. School heads of the three school sectors were satisfied with the achievement especially identified in their school ITEd plans covering the infrastructure requirements of the schools. They claimed that such achievement was a result of clear direction and ample support for building school infrastructure by the Government. However, the progress of the implementation of ITEd varied among schools. Lack of explicit requirements in putting ITEd strategies into practice in schools from the Government, some schools started to shift their school plans to other aspects of education reform. Such situation resulted in a very slow development of ITEd in some schools as claimed by the majority of representatives of the Community Group in this study. Although school heads perceived that the most important goal in formulating school ITEd plans was to enhance learning and teaching effectiveness and the top priority for their school ITEd plans for the 2005/06 and 2006/07 school years was to improve students' use of IT in their learning, the school heads perceived a relatively lower level of satisfaction, though still very positive, with their school ITEd plans on deriving measures of integrating IT in learning and teaching for these purposes. Regarding the evaluation of the effectiveness of ITEd in schools, school heads also perceived a relatively lower level of satisfaction, though still very positive, with its implementation.

As far as the difficulties in the implementation of ITEd were concerned, school heads, teachers and ITEd Team teachers of the three school sectors described similarly in two aspects – teachers' heavy workload and lack of suitable digital resources. Insufficient computer rooms or IT facilities and assistive devices were other difficulties indicated by school heads in primary and special schools respectively. Two major difficulties encountered by ITEd Team teachers of the three school sectors were insufficient provision of IT facilities and digital resources from the EMB as well as insufficient time to cope with ITEd Team work. Teachers also showed similar concerns about the above difficulties or obstacles in using IT. They tended to agree that the use of IT increased teaching workload and the design of general classrooms limited their use of IT in teaching. Hence, reducing teachers' workload, increasing the number of IT professionals and providing more digital resources for learning were the top three areas for improvement in ITEd indicated by the teachers of the three school sectors.

The culture of sharing good practices and collaboration among teachers and schools is critical to the success in ITEd development (Louis, Kruse & Raywid, 1996; DuFour & Berkey, 1995). This study revealed that the promotion of IT culture among schools and the education community was, to a certain extent, achieved at the school level. School heads of primary and special schools were satisfied with the collaborative team work and sharing activities among teachers in the use of IT for teaching in schools while secondary school heads were slightly less satisfied with this aspect than primary and special school heads This satisfactory perception was evident by the ITEd Team teachers of the three school sectors who tended to have some participation in exchanging their experiences and understanding of the use of IT in teaching with teachers of other schools, regions or countries as well as other teachers who tended to agree that they would share their teaching experience in using IT or teaching materials with colleagues and the others. Although the non-ITEd team teachers had attended various sharing activities, their perceived level of capability in sharing experience for promoting ITEd in the education community was still low despite a statistically significant increase in such aspect among the primary and secondary school teachers in MS2. At the community level, the establishment of Learning Centres with the assistance from the Government serves to promote an IT culture through modeling, disseminating and sharing of innovative resources and practices of the use of IT in the education community. However, this

study did not reveal any apparent findings that showed this potential impact during the implementation of the Second ITEd Strategy. It implies that further investigation into the needs and evaluations of the current practices in the existing Learning Centres are expected. Furthermore, the representatives of the Community Group expressed that the schools, despite the emergence of a sharing culture, still had limited collaboration with other schools and had not made very good use of the resources in their communities for these sharing activities. There is still room for improving this situation.

The measure of merging various IT grants and providing flexibility on the use of grants effectively enhanced schools' flexibility in allocating resources to support school-based ITEd plans. With respect to the appropriate use of resources, around half of the primary schools received funding from the Quality Education Fund (QEF) for IT-related projects in both MS1 and MS2. A significant increase was noted in the percentage of secondary and special schools receiving such funding for IT-related projects in MS2. The findings indicated that schools had made use of various funds to support school-based ITEd initiatives apart from Government funding such as those from parents and other organisations. The EMB continued to support schools with the disbursement of "Composite Information Technology Grant" (CITG) which allowed them to have much greater autonomy and flexibility for employment of technical staff, purchase of new software, maintenance or replacement of hardware, provision of IT training to teachers, trial of new information technologies and organisation of IT activities. School heads of primary and special schools tended to be satisfied with the current funding model of the CITG and secondary school heads and ITEd Team Teachers in the three school sectors were quite satisfied with this model.

The measure to enhance school leadership by providing training on e-leadership and application of ITEd in professional development programmes for school heads was effectively implemented. In MS1, around two-fifths of school heads of all school sectors participated in school professional development programmes or activities. 72% and 80% of primary and special school heads respectively found the programmes or activities to be effective or very effective in helping their teaching, administration and managerial work. A statistically significant increase (from 26% to 73% who rated these programmes as effective or very effective) was noted in secondary school heads' perceived level of effectiveness of these ITEd professional development programmes in helping their teaching, administration and managerial work in MS2. Three major themes which should be included into ITEd professional development programmes or activities were using IT in school administration or managerial work, formulation of school-based ITEd plans and using new technology in teaching. The two most desirable modes were workshops and training courses. Continuous professional development for school heads and the school leadership teams (such as the ITEd Team) in ITEd should be enhanced to support schools in establishing their own visions, goals and strategies for ITEd development in schools.

Recommendations

5. Continuous professional development is expected for school heads and the leadership teams of schools. Three major themes: IT for school administration or managerial work, formulation of school-based ITEd plans and use of new technology in learning and teaching are proposed.

6. It is suggested that an explicit ITEd plan of a school is expected to inform the design of a school curriculum that allows students to master the up-to-date IT knowledge and skills as well as to develop higher-order thinking skills and generic skills through using IT, to promote a sharing culture in schools and within the education community, and to derive evaluation measures for gathering information on the achievement of this ITEd plan and

identifying the needs and deficiencies for further improvement and development of ITEd in the school.

7. To evaluate the effectiveness of school ITEd plans, schools are encouraged to conduct school-based self-evaluation periodically. The use of the 'Self-evaluation Platform (SEP) on ITEd for Schools'[19], developed by the EMB is highly recommended for this purpose. The SEP is an online survey platform containing the evaluation instruments that have been developed in the present and the previous ITEd studies commissioned by the EMB according to a clearly defined evaluation framework with basic data analysis features which can provide schools with immediate results of an evaluation.

8. The current funding model is favoured by most of the school heads and therefore is suggested to be continued for sustaining the IT infrastructure and up-to-date IT facilities as well as for establishing a conducive working environment for teachers and for promoting sharing activities in schools and within the community.

10.4 Enriching Digital Resources for Learning

The findings from this study revealed that school heads of all school sectors were satisfied with the provision of up-to-date digital resources from various sources which were perceived as important to support learning and teaching. Primary school heads considered the digital resources from the HKEdCity as the most important source while secondary school heads considered the free digital resources downloaded from the Internet and those purchased by schools as the two most important sources. Special school heads considered that their major sources of digital resources were from the Internet and those produced by the teachers or therapists. However, the major source of digital resources which were used frequently as reported by the primary and secondary school teachers was from the textbook publishers. NC teachers also used those resources provided by textbook publishers occasionally. Such phenomenon implied that teachers of these three school sectors relied much on these resources for supporting their subject teaching. The ID special school teachers were different from the above teachers. They mainly used tailor-made digital resources developed by themselves so as to suit the unique needs of their students. Although teachers' use of digital resources from other sources was still low, a statistically significant increase was identified in MS2 in the usage of those self-developed resources by the secondary school teachers. An increase was also noted in the usage of those from the HKEdCity, the EMB and the various organisations from the community by primary school teachers. There was evidence to show that tertiary institutions, NGOs and the business sector, had contributed to the development of digital resources during the period of this study. With regard to the usage of digital resources assigned by teachers for learning subject knowledge or used by students on their own initiative for self-learning beyond school hours, free digital resources from the Internet, especially those from the HKEdCity as reported by the primary school students, was the most common source for these purposes. However, teacher-made digital resources were commonly used by special school students and ID teachers. It was noted that the measures taken by the Government for providing a favourable condition of achieving quality digital education resources to support learning and teaching were, to a considerable extent, effective.

Despite the above rather positive findings towards the use of digital resources for learning-related activities beyond school hours as reported by the school heads and teachers, this study showed that

[19] The SEP was fully integrated into the E-platform for School Development and Accountability in 2006. For details, please visit http://www.emb.gov.hk/sep/eng (English version) or http://www.emb.gov.hk/sep/chin (Chinese version).

the actual time spent on such activities was still minimal although the students of the primary, secondary and the NC special schools had spent more time on using computers at home or in other places than in school. It is, therefore, suggested that teachers should derive more student-centred activities that require the use of accessible digital resources provided by the schools or from the Internet after school.

Although many digital resources had been developed during the period of the present study and a statistically significant increase in the perceived level of the sufficiency of digital resources was identified in P6, S2 and S6 students as well as the primary school teachers in MS2, these resources were still not very sufficient, especially for the secondary school students and NC teachers who considered these resources as quite sufficient only. There is still a great demand in the market for suitable digital resources for subject teaching and those for facilitating students' development of higher-order thinking skills and generic skills. It was obvious that the lack of suitable digital resources was still one of the major problems that the schools encountered when implementing school ITEd plans. There is a need for continuing the "electronic Learning Credits" Scheme for schools to develop a school-based digital resources repository for enhancing and supporting learning and teaching. Such a demand was reflected by the school heads and a statistically significant increase in the level of importance of the digital resources purchased by means of the "electronic Learning Credits" was indicated by primary school heads in MS2.

In addition to the provision of digital resources, this study also revealed that the number of schools having e-learning platforms had increased significantly among the three school sectors. 76%, 83% and 53% of primary, secondary and special schools respectively reported having such platforms to facilitate learning and teaching in MS2 (61%, 75% and 33% respectively in MS1). Students and teachers generally agreed that e-learning platforms could help learning. However, it was found that only some teachers and students in the three school sectors reported having used such platforms for learning or teaching (MS1 and MS2: around one-third of the teachers and 30%-55% of the students in primary and secondary schools as well as 17%-43% of special school teachers and 27% to 58% of special school students). A statistically significant decrease was noted in the percentages of P6, S2, S4 and S6 students as well as NC students in special schools in MS2. Hence, in order to make full use of the ubiquitous feature of e-learning platforms that enables flexible learning beyond class times, a school-based digital resources repository (making use of the "electronic Learning Credits") is encouraged to be built within such platform and the use of the platform should be included as a policy in the school ITEd plans. Schools are also encouraged to use the resources provided by the HKEdCity which is considered as a central digital resources repository and sharing platform. Regarding the use of the digital resources provided by the HKEdCity, this study showed that primary school students used these resources more often than the secondary ones. There was a statistically significant increase in the percentages of primary and NC special school students and a decrease in secondary school students using such resources in MS2. Such phenomenon reflected that the digital resources provided by the HKEdCity might be more suitable for the primary school students and it was evident by the claims from the teachers and students of the primary schools in both MS1 and MS2. It is suggested that the role of the HKEdCity as a central digital resources repository and sharing platform should be continued. Its contribution as an agent for sourcing, revising and disseminating quality digital resources for the three school sectors should also be further strengthened. Furthermore, a ranking and evaluation system for making recommendation for the digital resources is suggested to be incorporated into the current website. More suitable resources for secondary school students should be included too to widen the spectrum of users. This website should be actively promoted and made known to people. The promotion was important to let people know what digital resources were available, so that they could benefit from the resources, as commented by the representatives of the Community Group.

Recommendation

9. Support like the "electronic Learning Credits" Scheme for developing a school-based digital resources repository for enhancing and supporting learning and teaching should be continuously provided.

10.5 Improving IT Infrastructure and Pioneering Pedagogy Using IT

With extensive input and support from the EMB, IT infrastructure had been well set up in schools and improved significantly. Well-built IT infrastructure was available and ready for use in learning and teaching. Hardware, such as number of computers installed in general classrooms and digital projectors, was greatly improved in schools, particularly in the primary school sector. The finding showed an improvement in the provision of computers in general classrooms despite the fact that the majority of computers in schools were located mainly in computer and special rooms. In MS1, computers were still not available in every classroom in primary and secondary schools whereas there was at least one computer installed in each general classroom in special schools. The number of computers in classrooms in primary schools increased significantly and there was almost one computer available in each classroom in MS2. The student-to-computer gross ratio (including all computers in school), student-to-computer net ratio (excluding computers in staff rooms and general office) and teacher-to-computer ratio (computers in staff rooms) for primary schools in MS1 were 5.95:1, 6.77:1 and 5.90:1 respectively. For secondary schools, respective ratios were 3.91:1, 4.63:1, and 5.21:1 whereas the ratios for special schools were 1.74:1, 2.24:1 and 3.00:1 respectively. The teacher-to-computer ratio for primary schools was improved significantly to 2.87:1 in MS2. These ratios were comparable to those reported by most of the advanced countries; for instance, the student-to-computer ratio was 6.1:1 in primary schools and 3.7:1 in secondary schools in the United Kingdom in 2005 (Becta, 2006); 4:1 and 5:1 respectively in New Zealand in 2004 (Johnson, Kazakov & Švehla, 2005); and 5.4:1 in public schools in the United States in 2001 (Kleiner & Farris, 2002). However, despite the above favourable figures, a very small proportion of primary schools (7% and 5% in MS1 and MS2 respectively) still did not have any computer installed in the staff room. It is important to provide teachers with adequate facilities to make their works more convenient and efficient (Semenov, 2005). It was suggested that every teacher should have his/her own computer to work with in the staff room, as claimed by the representatives of the Community Group.

The provision of additional digital projectors, to a certain extent, was improved. Digital projectors are necessary for presentation, and should be available in classroom to facilitate the use of IT in learning and teaching. The average number of digital projectors installed in 11.19 general classrooms in special schools was 5.65 in MS1. Statistically significant increase in the average number of digital projectors installed in general classrooms was observed in primary and secondary schools in MS2. The average number of digital projectors in primary schools increased from 14.68 to 17.46 and from 20.96 to 22.94 in secondary schools in MS2. With the adequate provision of digital projectors in classroom, creative use of computer programmes, such as involving multi-media, spreadsheet and online tests, in combination with a digital projector, other than the traditional use like simply presenting learning materials by teachers, can lead to a more active and exciting class for facilitating students' learning.

Given rather favourable IT infrastructure as reported above, schools heads of the three school sectors perceived positively in the provision of sound and sufficient IT facilities for students and teachers and they were satisfied with the current situation. However, teachers and students of different school sectors showed different perceptions of the level of sufficiency in such facilities. Primary and special school students perceived a higher level of sufficiency than that of secondary

school students on school IT facilities to meet their learning needs. Teachers of the secondary and ID special schools perceived a higher level of sufficiency than those of primary and NC special school teachers on school IT facilities to meet their teaching needs. Although NC special school students tended to perceive the assistive devices in schools as sufficient to meet students' needs, both ID and NC teachers in MS1 and MS2 as well as ID students in MS2 perceived that such devices in schools as quite sufficient only and the lowest rating was reported by ID-S students and H teachers in MS1 as well as ID-Mod students and teachers in MS2. Hence, the provision of more assistive devices for using IT facilities especially in ID special schools is expected.

Connectivity in schools was very good and improved greatly, particularly in the aspect of setting up wireless network for schools. In MS1, all schools in the three school sectors reported having broadband Internet connection. A statistically significant increase was noted in the percentage of schools having a connection speed of 10Mbps or higher in MS2. With such broadband connection, stakeholders in the schools were generally satisfied with the speed of the Internet access, except P6 students in MS1, secondary school students in MS1 and MS2 as well as NC teachers in MS1 who rated it as "quite satisfied" only. In addition to the above wired connection, 56%, 71% and 43% of primary, secondary and special schools respectively reported having at least 1 wireless LAN in schools in MS1. A statistically significant increase was noted in the percentage of schools having at least 1 wireless LAN in primary (from 56% to 73%) and special schools (from 43% to 75%) in MS2. It is foreseeable that more learning activities inside and outside the general classrooms will be seen with the use of this wireless technology in the school campus which provides a favourable environment for promoting student-centred learning. It was also noted that almost all schools had school websites and 73%, 92% and 82% of primary, secondary and special schools respectively had intranets in MS1. There was a statistically significant increase in the percentage of primary schools (from 73% to 82%) having intranets in MS2.

School heads of the three school sectors were satisfied with the measures for improving the IT infrastructure in schools and expressed that the IT facilities had effectively supported today's needs of learning and teaching. Students and teachers in primary and special schools (except NC teachers) perceived a higher level of sufficiency than secondary school students and teachers as well as NC teachers with regard to IT infrastructure such as upgraded computer model and operating systems in schools. Although a statistically significant increase was noted in primary school teachers' as well as primary and secondary school students' perceived sufficiency level of the IT infrastructure in MS2, students and teachers in secondary schools perceived the infrastructure as quite sufficient. The foundation of infrastructure was well-built. However, it is noted that the existing hardware will become obsolete after a period of time and there is a need for continuous replacement and maintenance of IT facilities, especially for secondary schools.

School heads of the three school sectors were satisfied with their adoption of advanced technologies to promote learning and teaching and expressed that such technologies could enhance not only the effectiveness in learning and teaching, but also assessment and school administration. Primary school teachers perceived a slightly higher level of sufficiency than secondary and special school teachers in the adoption of these technologies. The findings indicated that schools had been improving the IT infrastructure by upgrading and replacing the obsolete hardware and adopting advanced technology to enhance the effectiveness of learning and teaching in schools. However, for keeping up with the current well-built IT infrastructure, continuous funding should be provided to upgrade the IT facilities or to hire services which could help to maintain an environment conducive to ITEd in the schools. In this study, the school heads expressed their concerns and prioritized their needs regarding the IT facilities or services. Upgrading of the computers and digital projectors in general classrooms, the multi-media computer rooms and the e-learning platforms were the top three options in the list as indicated by the school heads of the primary and secondary schools whereas special school heads anticipated more assistive devices in addition to the first two options stated above in MS1. In addition to the above facilities, mobile learning

devices were also expected by school heads. It is anticipated that there will be more use of these devices by the students and teachers in the future learning activities.

Given well-equipped infrastructure, technical support services of high quality are also regarded as important for the implementation of ITEd strategies. This study showed that school heads of the three school sectors were satisfied with the quality of these services provided by the schools. Teachers and students of different school sectors, on the other hand, expressed different perceived levels of easiness on the acquisition of such services. Primary school students perceived a higher level of easiness than those of secondary and special school students to get support when encountering technical problems in using computers. A statistically significant increase was observed for P6 and secondary school students in MS2 implying that some extent of improvement had been made in this regard. Teachers of the three school sectors were satisfied with the technical support provided by IT technicians in schools. The satisfaction level of primary school teachers with the technical support from school-based technical support service providers and other technical support service providers significantly increased statistically while the satisfaction level of secondary school teachers with the technical support from the EMB increased in MS2. Hence, continuous provision of technical support services to schools should be maintained.

Education extends beyond classroom and continues long after the school hours. It is important to ensure the availability of IT facilities for students to perform IT-related learning activities beyond school hours. Primary and secondary school heads were satisfied with the provision of sufficient IT facilities for students beyond school hours whereas special school heads tended to be satisfied with this provision. This study showed that many schools (94%, 98% and 79% of primary, secondary and special schools respectively) had opened computer rooms for student use after school in MS1. No statistically significant difference was observed in MS2. ID students tended to consider such measure as sufficient whereas students from primary, secondary and NC special schools perceived a lower level of sufficiency. Although a statistically significant increase was observed for P6 and S2 students' perceived level of sufficiency of the opening hours of computer rooms beyond school hours in MS2, students indicated that such support was quite sufficient only. The support for the provision of IT facilities for students beyond school hours should be continued.

It is justified to conclude from the above findings that the measures taken by the Government to sustain efficient infrastructure and up-to-date IT facilities are successful. However, the current pedagogical practice was still more related to expository teaching with simple technology. IT infrastructure is ready, but it takes time for teachers to become familiar with technology and incorporate IT into the pedagogical design in line with the instructional objectives. As commented by the representatives of the Community Group, the available wireless network was not yet fully utilized as some notebook computers were not compatible with the system.

Recommendation

10. Continuous funding support to schools for upgrading IT facilities, soliciting support from technical professionals as well as providing computing facilities and after-school supporting services to the students is needed. Despite the provision of updated and advanced technology, the use of new technology in teaching, as well as the applications of IT in subjects or cross-curricula teaching and project-based or cross- curricular learning are more important for the development of ITEd. Hence, innovation and trials of new technologies and equipment that enhance learning and teaching should be encouraged and promoted among schools. Schools should make explicit ITEd planning on the above such as the infrastructure requirements, maintenance and replacement schedule on the computing facilities, the ITEd curriculum and pedagogy design.

10.6 Providing Continuous Research and Development

Evaluation and research by tertiary institutions or schools in innovative use of IT in learning and teaching are encouraged by the EMB for the continuous development of ITEd. In this study, it was encouraging that some schools began to take part in or to initiate pilot projects or schemes on exploring the effectiveness of the innovative use of IT for the enhancement of learning and teaching. School heads of all sectors tended to be satisfied with the achievement of this aspect and there was a statistically significant increase in primary school heads' level of satisfaction with continuous research and development in ITEd in MS2. Although the percentage of schools which initiated ITEd-related projects was still low (23%, 31% and 27% of primary, secondary and special schools respectively in MS1), collaborative pilot projects with other schools and organisations, especially local tertiary institutions were prevalent. Of these collaborative projects, 50%, 35%, and 56% of primary, secondary and special schools respectively claimed to have worked with local tertiary institutions; and 46%, 33% and 22% respectively with local community or commercial organisations in MS1. The findings showed that the community such as NGOs and business sector could contribute to this goal. However, a statistically significant decrease was identified in MS2 in the percentage of primary schools' collaborative activities with local community or commercial organisations (from 46% to 19%) implying that the collaboration with the community and business sector should be further promoted. In addition to the tertiary institutions, the NGOs and some organisations from the business sector, the EMB also had initiated some researches and studies (such as interactive whiteboard project and platform for consolidation and dissemination of good practices for pioneering pedagogies) and commissioned these projects to relevant organisations for supporting the implementation and continuous development of ITEd in Hong Kong. In this study, among those schools reported having pilot schemes or collaboration on the use of IT for teaching with other organisations, 40%, 32% and 33% of primary, secondary and special schools respectively had taken part in the EMB projects.

Involvement of schools in exploring new technology and developing innovative pedagogy will not emerge without the lead and guidance of school leadership teams. ITEd team teachers of the three school sectors indicated that they had some participation in this aspect when implementing school ITEd plans. However, there were little data from this study to show the participation of other teachers in this regard. The understanding and participation of school leadership teams, such as school heads and ITEd Team Teachers, as well as general teachers in pilot schemes should be further promoted.

School teachers learn from studying or evaluating the effectiveness of innovative IT pedagogical practice and sharing the experiences from other members in the education community. This process is important for the successful implementation of ITEd strategies and the development of IT-using culture in schools. Primary and secondary school heads perceived a slightly lower level of satisfaction with this aspect than taking part in pilot projects or scheme on teaching. ITEd Team teachers of the three school sectors also indicated that they had some participation only in research and evaluation on the effectiveness of ITEd in schools when implementing school ITEd plans. Regarding the usefulness of the support and resources from the EMB in developing teachers' ability in using IT for teaching, such as sharing the results of research-based projects with schools, teachers of the three school sectors generally expressed a neutral attitude towards this aspect. There is still room for further development of a research-based teaching culture on ITEd in the schools.

Recommendation

11. Conducting research on the effectiveness of the ITEd strategy and the impact of IT on students' learning outcomes remains a major agenda in the on-going development of ITEd in Hong Kong. As a well-structured evaluation framework and relevant instruments have been developed in this study, it is suggested that with the help of the EMB's Self-Evaluation Platform on ITEd for Schools, regular community-wide evaluation research can be conducted to monitor the effectiveness of the ITEd strategy. At the school level, the EMB should continue to initiate and to commission research projects on the impact of innovative use of IT on students' learning outcomes both in subject learning as well as higher-order thinking skills and generic competencies.

10.7 Promoting Community–wide Support and Community Building

Parental support is essential for students' learning with IT. As indicated by school heads of the three school sectors, provision of IT facilities at home was one of the most important parental support for students' learning with IT after school. In MS1 and MS2, over 90% of primary and secondary school parents and over 80% of special school parents provided computer facilities at home. Among them, over 90% of secondary school parents, over 80% of primary school parents and over 70% of the special school parents indicated having Internet access with broadband connection at home. Primary school students perceived a higher level of sufficiency with regard to the IT facilities and the speed of Internet connection at home than secondary and special school students. A statistically significant increase was observed in these two aspects for secondary school students in MS2. Except ID students in MS1 who perceived a higher level of sufficiency of assistive devices at home, parents and students of the special schools perceived such devices at home as quite sufficient only. However, such devices were especially inadequate for VI and ID-Mod students in MS1 and MS2 as well as ID-S in MS1. Around one-third of primary and secondary school parents also gave support to their children by allowing them to read IT-related books. Other types of parental support indicated by parents of the three school sectors were: buying IT-related hardware or software, allowing their children to attend IT courses and encouraging them to make use of community resources such as computer facilities in community centres and digital resources in libraries. In general, primary school students perceived a higher satisfaction level than secondary and special school students with the technical and learning support provided by family.

This study also revealed that the home-school collaboration and parents' involvement in the promotion of ITEd had been enhanced. Primary school heads perceived a higher level of satisfaction than secondary and special school heads with the setting up of programmes to encourage parents' involvement in ITEd and a statistically significant increase in satisfaction level with this aspect was observed for both primary and secondary school heads in MS2. Schools or the Parent-Teacher Associations in schools of the three school sectors had actively organised different home-school collaboration activities, such as encouraging parents to understand situations in school through visiting school websites or intranets and organising ITEd activities for parents. A statistically significant increase was noted in the percentages of primary and secondary schools provided ITEd activities for parents. In general, parents perceived that ITEd activities for parents were quite sufficient except NC parents who perceived a higher level of sufficiency in MS1. There was a statistically significant increase in the level of sufficiency as perceived by primary school parents in MS2.

The measures that put in place programmes for schools and the Parent-Teacher Associations helping the parents to deal with the ethical, legal and health issues involved in children's use of IT

were effective. Most of the parents of the three school sectors showed their concerns about the ethical, legal and health issues involved in using IT. A statistically significant increase was noted in the percentages of the primary and secondary school parents concerning the avoidance of using pirated software and spending long hours on computer or online games in MS2. The findings showed that parents concerned mostly about the long hours spent on online games by their children. In addition to online games, the representatives of the Community Group also claimed that many students indulged in instant messaging and stated that many parents had the intention to restrict their children to access the Internet. Such an excess use of IT for entertainment by students and restriction on students' access to the Internet by the parents may imply that students and parents still do not possess the proper attitude towards using IT as a learning and entertainment tool. In order to improve the above scenario, more independent learning activities with the use of IT such as the use of digital resources for subject learning or cross-curricular project-based learning should be promoted on one hand and more activities on parents' education in IL on the other hand. It is expected that through the above activities, students have to spend some time on completing the assigned learning tasks and can subsequently experience the benefits of using IT in learning. It is also anticipated that only if the parents understand the value of IL should they become supportive on students' use of IT at home. Therefore, in developing IT-related programmes for parents in the future, the focus should be on understanding the value of IL and parental support towards successful implementation of ITEd other than on equipping parents' IT skills.

In addition to the above activities for parents, frequent communication between the schools and parents is also considered as important for effective implementation of ITEd. The use of electronic means for communication such as e-learning platform is expected to be useful in this aspect. However, this study revealed that the use of e-learning platform for such purpose was still not common in the three school sectors. Further enhancement on home-school communication through the effective use of IT, such as keeping parents closely informed of students' behaviour and learning progress, should be promoted.

The IT-related organisations in the community such as those in the tertiary education, private and non-government sectors, showed contribution to ITEd in terms of providing learning activities for students, training activities for teachers, and digital resources as well as conducting research projects. It was encouraging that quite a number of schools had involved in community-school collaboration activities in pilot schemes or sharing activities on the use of IT for teaching. Among those collaborative activities that were launched in MS1, 41%, 54% and 64% of primary, secondary and special schools respectively launched pilot schemes with other organisations and 54%, 69% and 52% respectively organised sharing activities with other organisations. As for pilot projects in MS1, 50%, 35% and 56% of primary, secondary and special schools respectively collaborated with local tertiary institutions; whereas 46%, 33% and 22% of primary, secondary and special schools respectively with local community or commercial organisations in the 2004/05 school year. As for sharing activities, 44%, 43% and 77% of primary, secondary and special schools respectively often collaborated with "local primary, secondary and special schools". No statistically significant difference was found in the percentage of schools organising collaborative pilot projects with other organisations in MS2 except that there was a statistically significant decrease for the collaboration with local community or commercial organisations in primary schools. The findings indicated that there was relatively more community-school collaboration for pilot schemes or projects with local community or commercial organisations in secondary and special schools and a decrease for such collaboration in primary schools was observed in MS2. No statistically significant difference was noted for sharing activities in MS2.

Community-school collaboration enhanced sharing opportunities for keeping up the latest trend of ITEd development with regard to the innovative use of IT in learning among schools and between schools and the IT-related organisations in the community. By providing schools with up-to-date

IT facilities, digital resources and technical support, community-school collaboration also effectively helped in addressing the problems brought about by digital divide as perceived by the ITEd Team teachers. In addition to the significant contributions that had been made by the EMB such as the provision of IT facilities and digital resources to schools for the implementation of ITEd measures, school heads of the three school sectors tended to perceive that community bodies such as the Internet service providers, software and hardware service providers as well as IT application system developers also had made considerable contributions to this aspect whereas tertiary institutions and professional education organisations had made a slightly lower level of contributions than the former ones. They perceived that other government departments and community organisations or centres made some contributions to school development in ITEd. No statistically significant difference was found in MS2 except for the contribution from community organisations or centres as indicated by secondary school heads. Regarding the provision of IT facilities or resources by the HKEdCity, ITEd Team teachers of the primary and special school sectors tended to perceive the provision as sufficient (while those of the secondary school sector perceived the provision as quite sufficient), although a statistically significant decrease was found among primary school ITEd Team teachers in MS2.

More students of the three school sectors reported using computers in public libraries in both MS1 and MS2 (Primary: 37%-42%; Secondary: 24%-33%; Special: 20%-30%) than in community centres or youth centres (Primary: 16%-17%; Secondary: 4%-9%; Special: 6%-10%). Although a statistically significant increase was observed in the percentage of S4 students using computers in community centres or youth centres in MS2, the percentage was very small. The results indicated that students made more use of IT facilities and resources in the public libraries while the use of IT facilities in youth centres was not very popular. The findings also showed that students expected more support from the community, in particular from the public libraries.
Digital divide was less obvious in terms of the possession of home computers as revealed in this study. Home computers were quite widely available for students of the three school sectors in the low income group (families with monthly income less than $10,000). However, the Internet access was not extensively available to all the low income group families of primary and special schools. 85% or above of families of the three school sectors in the low income group had computers at home. 90% or more of families of secondary schools in low income group had Internet access. Amongst them, 93% or more had broadband connection. However, only 76% and 81% of families of primary schools in the low income group had Internet access at home in MS1 and MS2 respectively. Amongst those with Internet access at home, 10% and 12% of them had dial-up connection in MS1 and MS2 respectively. As for special schools, 78% of families in the low income group had Internet access at home in both MS1 and MS2. Amongst them, 11% of them had dial-up connection in both MS1 and MS2. On the other hand, 92% or more of families (with monthly income ≥ $10,000) of both primary and secondary schools had Internet access at home in MS1 and MS2. Amongst them, 4%-8% had dial-up connection. For the special school sector, 76%-92% had Internet access at home. The findings indicated that the opportunities of using IT for learning through Internet at home for students in low income group families were relatively limited when compared to students from other income group families due to unavailable Internet access or low Internet connection at home. The low Internet connection speed will definitely hinder the learning efficiency of students in using digital resources from the Internet.

Many measures were implemented to address the digital divide issue and school heads tended to be satisfied with such measures. For example, the measure to extend the opening hours of school computer facilities for student use after school was effectively implemented. Almost all primary and secondary schools and 79% of special schools opened computer rooms for students' use after school. However, students considered the opening hours of computer rooms beyond school hours as quite sufficient only, except ID student who perceived a higher level of sufficiency in this aspect. There is a need for continuous provision of such service to students so as to provide adequate IT facilities in school for learning activities beyond school hours. The other measures

such as computer recycling and donations (e.g.「家家有腦 – 電腦循環促進學習計劃」computer recycling scheme) to help needy students to bridge the digital divide were also progressively implemented. A statistically significant increase was noted in the percentages of students applying for computers from related organisations by primary and secondary schools and those schools calling for donation or recycled computers from parents or students by three school sectors in MS2.

Recommendations

12. Given that parental support and understanding of the value of ITEd is essential for successful implementation of the ITEd Strategy, it is suggested that home-school collaboration in terms of parent's education progammes and communication should be strengthened. Furthermore, in developing IT-related programmes for parents in the future, the focus should be on the understanding of the value of IL and parental support other than the teaching of IT skills. It is suggested that schools may attempt more use of electronic means for communication with the parents. Schools also are encouraged to partner with IT-related organisations in the community for soliciting the support, resources and expertise that help the implementation of various school ITEd activities.

13. This study revealed a rather encouraging achievement in addressing the issue of digital divide. The measures adopted in this study were welcomed by the education community. It is therefore suggested to be continued. Thus, continuous effort in soliciting community resources through various collaborative activities like the "Computer Recycling Scheme" and "Partners in Learning" etc. (see Section 2.3, p. 16) by the schools and the EMB as well as the funding to schools for providing after school support in the use of computing facilities are expected.

10.8 Conclusion

This report has described the progress of the ITEd Strategy in terms of different degree of achievements as well as the deficiencies in the seven goals stated in the strategic document *Empowering Learning and Teaching with Information Technology* (EMB, 2004). Thirteen general recommendations are made for improvement and further development of ITEd. One of the major scenarios of ITEd in Hong Kong found in this study is that the physical environment in terms of IT infrastructure and computing facilities has placed a solid ground for pedagogical changes and our teaching force is ready for such change. Great efforts also have been put in assisting such change by the Government. However, there are still obstacles that hinder this changing process. Before closing, the Project Team would like to draw the attention of the readers to the limitations of this study: Given the nature of the research method adopted in this study, the findings were self-reported and reflected only the personal perceptions of the stakeholders. It is suggested that for soliciting more in-depth information, field studies in selected sample schools may be conducted at the same time in the forthcoming evaluation research. The research method also can hardly reveal a thorough picture of ITEd in the special school sector owing to the difference in the educational goals as well as the complexity and diversity in the operation and management of different categories of special schools. Hence, an independent in-depth study on the evaluation of ITEd in the special school sector is expected.

References

Adelsberger, H.H., Collis, B., & Pawlowski, J.M. (Eds). (2002). *Handbook of information technologies for education and training.* New York: Springer.

Albion, P.R., & Ertmer, RA. (2002). Beyond the foundations: The role of vision and belief in teachers' preparation for integration of technology. *TechTrends,* 46(5), 34-38.

Au, W. K., Kong, S. C., Leung, K. P., Ng, M. W. E., & Pun, S. W. (1999). Levels of Information Technology (IT) Competency, Core Course Elements and Assessment Tools for Teacher Training in IT in Education, Hong Kong (in CD-ROM). The Hong Kong Education Department, Hong Kong SAR.

Ba, H., Tally, W. & Tsikalas, K. (2002). Investigating children's emerging digital literacies. *The Journal of Technology, Learning and Assessment.* 1(4), 1-48.

Barnett, H. (2003). Technology professional development: Successful strategies for teacher change. *ERIC Digest.* ERIC Clearinghouse on Information and Technology, Syracuse, NY. BBB30993. Retrieved on June 12, 2005. From: ERIC Digest.

Becker, H.J., Ravitz, J.L., & Wong, Y.T. (1999). *Teacher and Teacher-Directed Student Use of Computers and Software. (Teaching, Learning, and Computing: 1998 National Survey. 3).* Irvine, California: Center for Research on Information Technology and Organisations, University of California, Irvine.

Bennett, D., McMillan-Culp, K., Honey, M., Tally, B., & Spielvogel, B. (2000). *It all depends: Strategies for designing technologies for education change.* Paper presented at the International Conference on Learning with Technology, "Does Technology Make a Difference?". Philadelphia, Temple University.

Bereiter, C. (1998). *Education and mind in the knowledge age.* Retrieved on June 7, 2005. From: http://csile.oise.utoronto.ca/edmind/edmind.html

Beswick, N. (1977). *Resource-based learning*. London: Heinemann Educational Books Ltd.

Bowman, J. Jr., Newman, D.L. & Masterson, J. (2001). Adopting educational technology: implications for designing interventions. *Journal of Educational Computing Research,* 25(1), 81-94.

Boyd, S. (1997). *Learning by bytes: Computers in the classroom: Evaluation of the learning enhancement with information technology project.* Wellington, New Zealand: New Zealand Council for Educational Research.

Brandt, D.S. (2001). Digital literacies: A review of concepts. *Journal of Documentation,* 57, 218-259.

British Educational Communications and Technology Agency (Becta) (2002). *The Impact of Information and Communication Technologies on Pupil Learning and Attainment.* (ICT in Schools Research and Evaluation Series – No.7): DfES.

British Educational Communications and Technology Agency (Becta) (2005) *The Becta Review 2005: Evidence on the progress of ICT in education,* Coventry: Becta.

British Educational Communications and Technology Agency (Becta) (2006) *The Becta Review 2006: Evidence on the progress of ICT in education,* Coventry: Becta.

Burbules, N. (1997). Struggling with the Internet. *Campus Review,* 19-20, 22.

CEO Forum on Education and Technology. (1999). *School technology and readiness report. Professional development: A link to better learning.* Retrieved on January 17, 2003. From: http://www.ceoforum.org/downloads/99report.pdf

Chen, H.L. & Chung, J. (2000). *School Improvement in Taiwan :Problems and Possibilities. The Implementation of School-Based Curriculum Development.* Paper Presented at the Thirteenth Annual Conference of the International Congress For School Effectiveness and Improvement, January 4-8, 2000, Hong Kong. Retrieved on January 17, 2006. From: http://www.ied.edu.hk/cric/ic2000/proceedings.htm

Clark, R.E. (1983). Reconsidering research on learning from media. *Review of Educational Research, 53*(4), 445-459.

Collaborative for Technology Standards for School Administrators (CTSSA) (2001). *Technology Standards for School Administrators.* Retrieved on January 17, 2003. From: http://cnets.iste.org/tssa/pdf/tssa.pdf

Committee on Developments in the Science of Learning (Ed.) (2000). *How people learn: Brain, mind, experience and school.* Washington DC: National Academic Press.

Cuban, L. (1988). *A fundamental puzzle of school reform.* Phi Delta Kappan, 70(1), 341-344.

Cuban, L. (2001). *Oversold & underused: Computers in the classroom.* Cambridge, MA: Harvard University Press.

Curriculum Development Council (CDC). (2000). *Information Technology Learning Targets. A guideline for schools to organize teaching and learning activities to develop our students' capability in using IT*. Hong Kong: Education and Manpower Bureau.

DeCorte, E. (1990). Learning with new information technologies in schools: Perspectives from the psychology of learning and instruction. *Journal of Computer Assisted Learning,* 6, 69-87.

Dede, C., L'Bahy, T. & Whitehouse, P. (2002). Designing and studying learning experiences that use multiple interactive media to bridge distance and time. C. Vrasidas & G. Glass (Eds.) *Current Perspectives on Applied Information Technologies. Vol. 1: Distance Education and Distributed Learning.* Greenwich, Conn.: Information Age Pub.

DEPICTS (2004). *The Common Evaluation Framework – Measuring the impact of whole-school ICT*. Retrieved on June 7, 2005. From: http://www.becta.org.uk /page_documents/leaders/cef_guidance.pdf

Doiron, R. & Davis, J., (1998). *Partners in learning: Students, teachers, and the school library*. Englewood, CO: Libraries Unlimited.

DuFour, R. & Berkey, T. (1995). The principal as staff developer. *Journal of Staff Development,* 16(4), 2-6.

Dwyer, D. (1994). Apple classrooms of tomorrow: What we've learned. *Educational Leadership, 51*(7), 4-10.

Education and Manpower Bureau (EMB). (1998). *Information Technology for Learning in a New Era: Five-year Strategy – 1998/99 to 2002/03.* Hong Kong: Education and Manpower Bureau.

Education and Manpower Bureau (EMB). (2004). *Empowering learning and teaching with information technology*. Hong Kong: Education and Manpower Bureau.

Education and Manpower Bureau (EMB). (2005a). *Information Literacy for the 21st Century*. Retrieved on January 3, 2006. From: http://www.emb.gov.hk/index.aspx?langno=1&nodeID=4388

Education and Manpower Bureau (EMB). (2005b). *Overall study on reviewing the progress and evaluating the information technology in education (ITEd) projects 1998/2003*. Hong Kong: Education and Manpower Bureau.

Edwards, L.D. (1995). The design and analysis of a mathematical microworld. *Journal of Educational Computing Research, 12*(1), 77-94.

Evans, M. (2002). Open windows: becoming an e-learning school. *National College for School Leadership (NCSL).*

Farmer, L.S.J. (1999). *Cooperative learning activities in the library media centre*. Englewood, CO: Libraries Unlimited.

Fisher, D. & Stolarchuk, E. (1998). The effect of using laptop computers on achievement, attitude to science and classroom environment in science. *Proceedings Western Australian Institute for Educational Research Forum 1998.*

Gay, L.R. & Airasian, P. (2003). *Educational Research: Competencies for analysis and applications* (7th ed.). Upper Saddle River, N.J.: Merrill/Prentice Hall.

Hannafin, M.J., Hill, J.R. & Land, S.M. (1997). Student-centered learning and interactive multimedia: Status, issues, and implications. *Contemporary Education, 68*(2), 94-99.

Haycock, C.A. (1991). Resource-based learning: A shift in the roles of teacher, learner. *NAASP Bulletin, 75*(535), 15–22.

Henderson, A.T & Mapp, K.L. (2002). *A new wave of evidence: the impact of school, family, and community connections on student achievement.* Austin: Southwest Educational Development Laboratory.

Hong Kong Institute of Education (HKIEd). (1999). *Usage of IT in Schools. Final Report: Students.* Final report of a project conducted for the Education Department, The Government of Hong Kong Special Administration Region.

International Society for Technology in Education (ISTE). (1998a). *Educational technology standards and performance indicators for all teachers.* Retrieved on January 17, 2006. From: http://cnets.iste.org/teachers/t_stands.html

International Society for Technology in Education (ISTE). (1998b). *National education technology standards for students.* Retrieved on January 17, 2006. From: http://cnets.iste.org/students/s_stands.html

International Society for Technology in Education (ISTE). (2002). *National educational technology standards for teachers: Preparing teachers to use technology.* Retrieved on January 17, 2006. From: http://cnets.iste.org/teachers/t_book.html

Johnson, M., Kazakov, D. & Švehla, M. (2005). *ICT in Schools 2005 – Information & Communications Technology in New Zealand Schools 1993-2005.* Retrieved on January 17, 2006. From: *http://www.2020.org.nz/docs/ICT_2005_survey.pdf*

Jonassen, D.H. (1996a). *Computers in the classroom: Mindtools for critical thinking.* Englewood Cliffs, NJ: Prentice Hall.

Jonassen, D. H. (Ed.) (1996b). *Handbook of research for educational communications and technology: A project of the Association for Educational Communications and Technology.* New York: Macmillan.

Jonassen, D.H. (1997). Instructional design models for well-structured and ill-structured problem-solving Learning Outcomes. *Educational Technology.* Research and Development 45, 1, 65-94.

Jonassen, D.H. (2000). *Computers as mindtools for schools: engaging critical thinking.* (2nd. Ed.) New Jersey: Prentice Hall.

Jonassen, D.H., Campbell, J.P., & Davidson, M.E. (1994). Learning with media: Restructuring the debate. *Educational Technology Research and Development, 42*(2), 31-39.

Jonassen, D., Howland, J., Moore, J. & Marra, R. (2003). *Learning to solve problems with technology: a constructivist perspective.* Upper Saddle River, N.J.: Merrill/Prentice Hall.

Kanaya, T., Light, D. & Culp, K. M. (2005). Factors influencing outcomes from a technology-focused professional development program. *Journal of Research on Technology in Education,* 37(3), 313-330.

Kaplowitz, M.D., Hadlock, T.D. & Levine, R. (2004). A comparison of web and mail survey response rates. *Public Opinion Quarterly, 68*(1), 94-101.

Kish, L. (1965). *Survey Sampling*. New York: John Wiley & Sons.

Kleiner, A. & Farris, E. (2002). *Internet Access in U.S. Public Schools and Classrooms: 1994-2001*. National Center for Education statistics. Retrieved on February 3, 2006. From: http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002018

Knapp, L.R. & Glenn, A.D. (1996). *Restructuring Schools with Technology.* Boston: Allyn and Bacon.

Knupfer, N. (1991). Teachers and educational computing: Changing roles and changing pedagogy. In N. Knupfer, R., Muffoletto, M. McIsaac, A. Bork, R. Koetting, & A.A. Yeaman (Eds.), Educational computing social foundations: A symposium (pp. 332-342). *Proceedings of selected research presentations at the annual convention of the Association for Educational Communications and Technology.* Phoenix, Arizona.

Kozma, R.B. (1991). Learning with media. *Review of Educational Research, 61*(2), 179-211.

Kozma, R.B. (2003). Material and Social Affordances of Multiple Representations for Science Understanding. *Learning and Instruction*, 13(2), 205-226.

Krentler, K.A. & Willis-Flurry, L.A. (2005). Does Technology Enhance Actual Student Learning? The Case of Online Discussion Boards. *Journal of Education for Business*, 80 (6), 316-322.

Laferrière, T., Breuleux, A., & Bracewell, R. (1999). *Benefits of Using Information and Communication Technologies (ICT) for Teaching and Learning in K-12/13 Classrooms*. SchoolNet Program Industry Canada.

Land, S.M. & Hannafin, M.J. (1996). A conceptual framework for the development of theories-in-action with open-learning environments. *Educational Technology Research and Development, 44*(3), 37-53.

Law, N., Lee, Y., & Chow, A. (2002). Practice characteristics that lead to 21st Century learning outcomes. *Journal of Computer Assisted Learning, 18*(4), 415-26.

Leach, E.J. (2005) Community and Technical Colleges, Information Technology, and Revolutionary Times. *Community College Week.* USA: Cox, Matthews, & Associates, Inc. 18(8). Retrieved on February 3, 2006. From: http://www.league.org/publication/abstracts/leadership/labs200510.html

Lee, K.T, Lam, Y.S. & Li, K.M. (2004). Use of Information Technology to cope with *Individual Difference*, Final Report, Education & Manpower Bureau Research Project, Hong Kong: Education & Manpower Bureau.

Lemke, C., & Coughlin, E.C., (1998). *Technology in American Schools: Seven Dimensions for Gauging Progress.* Milken Exchange of Education Technology.

Levine, L.E. (2002). Using Technology to Enhance the Classroom Environment. *T.H.E. Journal,* 29(6), four pages. Retrieved on June 3, 2004. From: http://www.thejournal.com/magazine/vault/articleprintversion.cfm?aid=3819

Light, J.S. (2001). Rethinking the digital divide. *Harvard Educational Review*, 71(4),709–733.

Liu, X.F., Macmillan, R. & Timmons, V. (1998). Assessing the impact of computer integration on students. *Journal of Research on Computing in Education,* 28(4), 461-485.

Loveless, A., DeVoogd, G. & Bohlin, R. (2001a). Something Old, Something New… Is pedagogy affected by ICT? In A. Loveless & Ellis V. (Eds) *ICT, Pedagogy and the Curriculum: Subject to change*, pp. 63-83. London: RoutledgeFalmer.

Loveless, A. & Ellis, V. (Eds.) (2001b). *ICT, Pedagogy and the Curriculum: Subject to change.* London: RoutledgeFalmer.

Louis, K., Kruse, S., & Raywid, M. (1996). Putting teachers at the center of reform: Learning schools and professional communities. *National Association of Secondary School Principals Bulletin,* 80(580), 9-21.

MacGregor, K.S., & Lou, Y.P. (2004). Web-Based Learning: How Task Scaffolding and Web Site Design Support Knowledge Acquisition. *Journal of Research on Technology in Education,* 37(2), 161-176.

McGettrick, A. & Mansor, N. (1999, June). Standards and levels — a case study. *Assessment and Evaluation in Higher Education.* 24(2), 131-141.

Means, B. & Olson, K. (1997). *Technology and education reform.* Office of Educational Research and Improvement, Contract No. RP91-172010. Washington, DC: U.S. Department of Education. Retrieved on February 3, 2003. From: http://www.ed.gov/pubs/SER/Technology/title.html

Miles, M.B. & Huberman, A.M. (1994). *Qualitative data analysis: An expanded source book.* Thousand Oaks: Sage Publications Ltd.

Mioduser, D., Nachmias, R., Tubin, D. & Forkosh-Baruch, A. (2002). Models of Pedagogical implementation of ICT in Israeli Schools. *Journal of Computer Assisted Learning,* 18(4), 405-414.

Morrison, G.R. & Lowther, D.L. (2002). *Integrating Computer Technology into the Classroom.* (2nd ed.). New Jersey: Merrill Prentice Hall.

National Research Council. (1999). *Being fluent with information technology.* Washington, DC: National Academy Press. Retrieved on February 7, 2006. From: http://newton.nap.edu/html/beingfluent/

Newhouse, C.P. (2002a). *Literature Review: The Impact of ICT on Learning and Teaching*, Perth, WA: Specialist Educational Services.

Newhouse, C.P. (2002b). *A Framework to Articulate the Impact of ICT on Learning in Schools.* Western Australian Department of Education. Western Australia: Specialist Educational Services. Retrieved on June 7, 2005. From: http://www.eddept.wa.edu.au/cmis/eval/downloads/pd/impactframe.pdf

Newman, F. M., & Wehlage, G. G. (1995). *Successful school restructuring: A report to the public and educators.* Madison, Wisconsin: Center on Organization and Restructuring Schools, Wisconsin Center for Education Research, University of Wisconsin.

Organisation for Economic Co-operation and Development (OECD) (2001). *Schooling for Tomorrow: Learning to Change: ICT in Schools,* p.87-96. Retrieved on June 20, 2005. From: http://www1.oecd.org/publications/e-book/9601131e.pdf

Office for Standards in Education (Ofsted) (2004). *ICT in Schools: The Impact of Government Initiatives Five Years On,* HMI 2050, Ofsted, London.

Pajares, M.F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research,* 62, 307-332.

Pedretti, E., Mayer-Smith, J., & Woodrow, J. (1998). Technology, text, and talk: Students' perspectives on technology-enhanced secondary science classroom. *Science Education, 82*(5), 569-589.

Perkins, G.H. (2004). Will libraries' web-based survey methods replace existing non-electronic survey methods? *Information Technology and Libraries, 23*(3), 123-126.

Plomp, T. & Pelgrum, W.J. (1992). Restructuring of schools as a consequence of computers. *International Journal of Educational Research*, 19, 185-195.

Ravitz, J., Wong, Y. & Becker, H. (1999). *Teaching, learning and computing: 1998: Report to participants. Irvine, CA: Center for Research on Information Technology and Organizations.* Retrieved on March 11, 2006. From: http://www.crito.uci.edu/ tlc/findings/special_report/ index.htm

Reeves, T.C. & Hedberg, J.G. (2003). *Interactive learning systems evaluation.* Englewood Cliffs, NJ: Educational Technology Publications.

Réginald Grégoire inc., Bracewell, R. & Laferriére, T. (1996). *The contribution of new technologies to learning and teaching in elementary and secondary schools.* Retrieved on January 17, 2005. From: http://www.tact.fse.ulaval.ca/fr/html/apport/impact96.html

Riel, M.M. (1998). *Just-in-time learning or learning communities.* Abu Dhabi: The Fourth Annual Conference of the Emirates Center for Strategic Studies and Research.

Rodrigues, S. (1997). Fitness for purpose: A glimpse at when, why and how to use information technology in science lessons. *Australian Science Teachers' Journal*, *43*(2), 38-39.

Roschelle, J., Pea, R., Hoadley, C., Gordin, D. & Means, B. (2000). Changing how and what children learn in school with computer-based technologies. *Future of Children*, 10(2), 76-101.

Sandholtz, J.H., Ringstaff, C. & Dwyer, D. (1997). *Teaching with technology: Creating student-centered classrooms.* New York: Teachers College.

Schacter, J. (1999). *The impact of education technology on student achievement: what the most current research has to say.* Santa Monica, CA.: Milken Exchange on Education Technology.

Schein, E.H. (1997). *Organizational culture and leadership* (2nd Ed.). San Francisco: Jossey-Bass.

Scott, B. & Hannafin, R. (2000). How teachers and parents view classroom learning environments: An exploratory study. *Journal of Research on Computing in Education,* 32(3) 401-416.

Semenov, A. (2005). *Information and Communication Technologies in Schools. A Handbook for Teachers.* United Nations Educational, Scientific and Cultural Organization. Retrieved on March 11, 2006. From: http://unesdoc.unesco.org/images /0013/001390/139028e.pdf

Sheingold, K. & Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice* (Report No. IR 014 677). New York, NY: Center for Technology in Education, Bank Street College of Education.

Sivin-Kachala, J. & Bialo, E. (1996). *Report on the effectiveness of technology in schools, 1995-1996.* Washington, DC, Software Publishers Association.

Somekh, B., Lewin, C., Mavers, D., Harrison, C., Comber, C., Fisher, T., Haw, K., Lunzer, E., McFarlane, A., Scrimshaw, P. & Watling, R. (2002). *ImpaCT2 Final Report Part 3: Learning with ICT: Pupil' and Teachers' Perspectives.* London, DfES.

Staples, A., Pugach, M.C. & Himes, D. (2005). Rethinking the Technology Integration Challenge: Cases from Three Urban Elementary Schools. *Journal of Research on Technology in Education,* 37(3), 285-312.

Stufflebeam, D (2000). The Context, Input, Process, Product (CIPP) model for program evaluation. In D. Stufflebeam, G. Madaus, & T. Kellaghan, *Evaluation Models: View-points on Educational and Human Service Evaluation.* Boston: Kluwer-Nijhoff, 279-315.

Talja, Sanna. (2005). The social and discursive construction of computing skills. *Journal of the American Society for Information Science and Technology.* 56(1), 13-23.

Telem, M. (2001). Computerization of school administration: impact on the principal's role - a case study. *Computers and Education*, 37, 345-362.

Thornburg, D.D. (1998). *Reading the future: Here's what's on hand for technology and education. Electronic School.* Retrieved on January 7, 2006. From: http://www.electronic-school.com/0698f1.html

Todd, Ross J. (1998). WWW, critical literacies and learning outcomes. *Teacher Librarian.* 26 (2), 16-22.

Topper Andrew. (2004). How are we doing? Using self-assessment to measure changing teacher technology literacy within a graduate educational technology program. *Journal of Technology and Teacher Education.* 12(3), 303-318.

Treagust, D.F. & Rennie, L.J. (1993). Implementing Technology in the School Curriculum: A Case Study Involving Six Secondary Schools. *Journal of Technology Education.* 5(1). Retrieved on January 17, 2006. From: http://scholar.lib.vt.edu/ejournals/JTE/v5n1/treagust.jte-v5n1.html#Vohra

Valdez, G., McNabb, M, Foertsch, M., Anderson, M., Hawkes, M. & Raack, L. (2000) *Computer-Based Technology and Learning: Evolving Uses and Expectations,* North Central Regional Educational Laboratory. Naperville, Illinois.

Vohra, F.C. (1987). Technology as part of general education. In K. Riquarts, (Ed.), *Science and Technology Education and the Quality of Life.* Kiel, Germany: University of Kiel. 410-418.

Watson, D. (Ed.). (1993). *The Impact Report: An evaluation of the impact of information technology on children's achievements in primary and secondary schools*. London: King's College.

Webb, M. & Cox, M. (2004). Review of Pedagogy related to ICT, *Technology, Pedagogy and Education*, 13(3), 235-286.

Wenglinsky, H. (1998). *Does it compute? The relationship between educational technology and student achievement in mathematics*. Princeton, NJ: Policy Information Center, Educational Testing Service.

Wenglinsky, H. (2005) Technology and Achievement: The Bottom Line. *Educational Leadership,* 63(4), 29-33.

Wetzel, K., Zambo, R. & Padgett, H. (2001, Fall) A Picture of Change in Technology-Rich K-8 Classrooms. *Journal of Computing in Teacher Education*, 18(1), 5-11.

Wheeler, S., Waite, S. & Bromfield, C. (2002). Promoting Creativity through the use of ICT. *Journal of Computer Assisted Learning.* 18 (3), 367-378.

Williams, D., Hricko, M. & Howell, S.L. (Eds) (2006). *Online assessment, measurement, and evaluation: emerging practices.* Hershey, Pa.: Information Science Publisher.

Wilson, B.G. (1995). Metaphor for instruction: Why we talk about learning environments. *Educational Technology,* 35 (5), 25-30.

U.S. Department of Commerce (1999). *Falling Through the Net: Defining the Digital Divide.* Washington D.C.: National Telecommunications and Information Administration.

Yee, D.L. (2000). Images of school principals' information and communications technology leadership. *Journal of Information Technology for Teacher Education,* 9 (3), 287-302.

Zhao, Y., Pugh, K., Sheldon, S. & Byers, J. (2002). Conditions for Classroom Technology Innovations. *Teachers College Record,* 104 (3), 482-515.