

## CHAPTER 3.2 GOVERNMENT MONITORING OF THE POLICY IMPLEMENTATION

### 3.2.1 Introduction

In addition to developing and implementing various IT in education initiatives, the Education Department has also been conducting various forms of monitoring and evaluation exercises as well as commissioned various studies to monitor and evaluate progress and to inform decisions. Of the 296<sup>1</sup> non-duplicated documents provided by the Education Department, 38 were broadly categorized as evaluation reports<sup>2</sup> of this nature. In particular, one ED commissioned research report on “Levels of Information Technology (IT) Competency, core course elements and assessment tools for teacher training in IT in education” conducted by HKIED in Nov. 1999 is included in the analysis reported in this chapter as the research team found this to be of relevance to the study. These 38 evaluation documents pertain to different categories, as follows:

Table 3.2.1 Summary of documents in the monitoring and evaluation category.

Category	No. of doc.	Description
0 - general (incl. IT Pilot Scheme)	2	<ul style="list-style-type: none"> <li>◆ Usage of IT in schools, 11/98</li> <li>◆ Review of IT Pilot Scheme, 04/2001</li> </ul>
1 & 1, 2, 5 – access	9	<ul style="list-style-type: none"> <li>◆ Utilization of ITLC in 46 schools, &amp; appendix (report date unknown, data collection 11/99)</li> <li>◆ Progress of establishment of computer lab 04/00, 08/00</li> <li>◆ Usage of ICT facilities in youth centers, 08/00 &amp; 11/00</li> <li>◆ Questionnaire on the Provision of IT facilities in Schools for Parents and Public Use (Results)</li> </ul>
2 – connectivity	2	<ul style="list-style-type: none"> <li>◆ Education specific intranet consultancy study, 10/99</li> <li>◆ Report on site preparation for schools , 10/2001</li> </ul>
3 – teacher enablement	24	<ul style="list-style-type: none"> <li>◆ Levels of IT competence study by HKIED, 11/99</li> <li>◆ Summary statistics of teacher enablement programs</li> <li>◆ Student evaluation results reported by various vendors</li> <li>◆ On-site visit reports by IS</li> <li>◆ Training/sharing sessions related to the use of ITLC and CL</li> <li>◆ Teacher competence status report from schools</li> </ul>
5 – resource support	1	<ul style="list-style-type: none"> <li>◆ Study on ITC scheme, 02/2001</li> </ul>

The above reports completed at various stages of implementation should be a rich resource for the current study to draw on. The initial intention was to conduct a meta-analysis of the

<sup>1</sup> This number excludes duplicate documents and includes one consultancy report commissioned by ED and completed in November, 1999, not included in the collection provided by ED,

<sup>2</sup> During the research process, ED emphasized that the nature of some of these reports (especially the reports by ED staff on visits to some classes run by various training vendors ) were *not* evaluative, and were conducted mainly for reviewing progress, monitoring and fine-tuning purposes.

various evaluation studies for this purpose. Unfortunately, as these evaluation studies were mostly conducted independently for specific purposes (such as meeting vendors to follow-up teacher training programs), without a view to further studies based on their data, a systematic meta-analysis was not possible.

As can be seen from the above table, most of the monitoring and evaluation documents in the collection (24 out of 38) belonged to the teacher enablement category, nearly all of which (with the exception of one document) were summaries of student evaluations submitted by vendors on the training services provided by them. Unfortunately, there was no common structure for these evaluation surveys, subject to practical needs of different ED divisions / sections, and the information was incomplete for many of the evaluation reports received that rigorous statistical meta-analysis could not be carried out. However, a rough description of the reports received together with some attempts at meta-analysis of a few items will be reported.

The remaining 15 evaluation documents were very diverse. What the team has attempted to do with these, however, is to provide, on the basis of the findings reported, a general picture of the status of implementation at various times from different perspectives. This description will be useful for triangulating with the other research findings from the current study.

### **3.2.2 Status of IT usage in schools**

“Usage of IT in schools” was a survey research commissioned by the Education Department to find out the levels of IT readiness as perceived by principals, teachers and students. This was conducted immediately before the publication of the 5-year IT in education strategy document and was intended to provide some baseline information as well as to provide input to the implementation process.

As only the executive summary was provided, the research team has no information as to the sampling method or the sample size. The study revealed that secondary school students generally had more experience of using computers, with over 90% claiming experience in playing computer games, over 76% claiming experience in word processing and 60% claiming experience in searching the Internet for information. Primary students on the other hand had less experience in the use of computers, though 45% claimed skills in searching for information on the Internet. Access at home differed greatly too, with secondary students averaging at 72% and primary students at 47%. Access to computers at school differed even more, with 67% of secondary school students and only 20% of primary school students claiming access.

The study also reported on the attitude of teachers and principals. While 93% of principals agree that teachers should be competent in the use of IT for teaching and learning, only 68% of primary teachers and 72% of secondary teachers share this view. Furthermore, only 39% of primary teachers and 46% of secondary teachers showed high levels of agreement that they are willing to change their teaching methods to incorporate the use of IT. Teachers were generally holding positive attitudes towards IT changes in schools though the awareness of IT issues and ability to solve technical problems was reported to be low. Gender differences as well as differences across the primary and secondary sectors were observed, with secondary school male teachers reporting the greatest need for more training while female primary teachers was the sector that had the highest percentage who claimed that they had adequate IT skills. On the other hand, male teachers scored higher on their self-assessed IT competence while there were a greater proportion of female teachers who reported being not confident

about IT use. It was also reported that teachers felt inadequately prepared in terms of pre-service courses for use of IT in schools. Teachers also found the lack of physical resources such as space and IT equipment to be barriers to the effective use of IT in classrooms.

The report recommended that principals should be given support to empower them with sufficient knowledge to play a key role in the promotion of IT in schools. The report also pointed out that principals need to provide on-going vision and leadership in the development and implementation of new learning technology plans.

The report also recommended greater access and support to primary school students and to provide more Internet connections at school. It also recommended that professional development courses be provided to teachers so that students can be guided in their use of IT for learning and to benefit from the use of IT in classroom teaching. Recommendations on teacher professional development included the provision of information on a full range of technology options, provision of credits towards further studies for taking IT related professional development programs, the provision of school-based in-service programs with strong curricular focus and the provision of online learning, resources and support to teachers. It also recommended that professional development courses should cater for disparities in teachers' IT knowledge and that more advanced teachers be provided with more advanced technologies.

### **3.2.3 IT Pilot Scheme**

The IT Pilot Scheme was initiated in early 1998 before the release of the 5-year IT in Education implementation strategy. The scheme selected 10 primary and 10 secondary schools as pilot schools on the basis of their readiness to implement IT in education. These schools were to be provided with extra funding (\$6 M and \$3.7M for each secondary and primary school respectively) over two years to set up the schools' information infrastructure as well as one additional teacher for 2 years. The schools were given the scope to try out different hardware and software solutions and to experiment with curriculum and pedagogical innovations. It was hoped that the experiences from these pilot schools would provide input to policy implementation as well as to share their experiences with other schools.

This document reported on an evaluation study conducted by 8 seconded teachers between September to November 2000, immediately after the completion of the Pilot Scheme.

The description summarizes key points made that have been substantiated by evidence included in the report.

#### *3.2.3.1 Role of pilot schools*

The IT Pilot Scheme was set up *before* the 5-year IT implementation plan. The pilot schools were identified to be IT ready schools keen to implement IT across the curriculum, which were then provided with relatively good resources so as to act as pioneers to establish viable practices for the implementation of IT in education.

#### *3.2.3.2 Achievements:*

The following are the clearly identifiable achievements made by the pilot schools at the end of the project period:

These schools have achieved a reasonably good infrastructure even by international standards. The mean student to computer ratio was 8:1 (the report did not mention the range of variation, only the mean was reported). The actual number of computers in each school varied greatly, from 83 to 230 in primary schools and 118 to 400 in secondary schools.

All schools have installed fast Ethernet connections to the Internet and connectivity for a large number of computers (min. of 120 nodes and 176 nodes for primary and secondary schools respectively).

In terms of teacher enablement, nearly all teachers in the pilot schools had attained BIT level by the end of 2000. Unfortunately, the report did not report on the range of differences across schools here.

In terms of teaching and learning, while all pilot schools have made a lot of efforts in this direction, it is difficult to highlight clear general achievements in this area. The pilot schools have engaged in a large diversity of teaching and learning activities, which are potentially interesting, test-beds to be studied.

#### *3.2.3.3 Diversities in development*

A special feature of the Pilot Scheme is that the absence of guidance on what the pilot schools should achieve in terms of infrastructure or the other aspects of implementation. This has resulted in a wide diversity of practices and achievements. In addition to the overall diversities in development, there were noticeable differences across primary and secondary schools in terms of implementation goals and strategies.

In terms of infrastructure, not only the number of computers varied greatly across schools, how the computers were distributed within the school premises varied greatly. The number of computer rooms varied from 2 to 9 in secondary schools and 1 to 5 in primary schools. The OS used was predominantly Windows. There were mixed platforms including Mac & Unix. The servers used were mainly NT but also included Linux.

It was also reported that many pilot schools had additional resources from QEF for additional hardware, but no detail was provided.

Most secondary schools had an intranet to support teaching and learning while only one primary school had such a setup.

Students' role & participation may vary greatly as well. It was reported that in one pilot school, over 20 servers were set up and maintained by students. Four secondary schools provided free Internet access for students in the entire school premise but only one primary school had such provisions.

Differences between primary & secondary pilot schools in terms of teacher enablement modes were also reported. Most pilot secondary schools used a school-based mode of training at the BIT level while pilot primary schools mostly preferred tailor-made training courses provided by vendors. However, the exact proportion of schools engaged in each mode of training for the two levels was not available.

In terms of teaching and learning, there appears to be a big difference between primary and secondary schools in terms of their focus for development and their understanding of the main

curriculum goals for IT integration. Pilot primary schools tended to focus on IT as a courseware medium and put much effort into the production of courseware. The most recent development in this direction is to change from having teachers to act as courseware producers to outsourcing the production. Pilot secondary schools seem to have produced more diverse pedagogical practices, many of which integrated the communication aspect of ICT as well as the use of the Internet to support more student-directed modes of learning. There is also diversity in the use of the Internet, some focusing on the Internet as a delivery platform for more traditional approaches to teaching and learning, namely tutorial and self-access drill and practice type of web-based learning, while others explored the use of the internet to support exploratory and collaborative modes of self-directed learning.

#### *3.2.3.4 Contributions of the Pilot Scheme in terms of policy implementation*

The government did not have very specific implementation targets or strategies developed when the commitment was made to put the integration of ICT across the curriculum as one of its primary strategic goals in education. Colleagues from the ED had thus been observing and liaising with pilot schools closely in order to work out specific plans and strategies for the territory-wide implementation. Such observations and liaisons have resulted in the development of several major projects in the territory-wide implementation process. Examples quoted in the report include:

1. *The Multimedia Learning Centre Project*: “Nearly all pilot schools had installed classroom management and control systems in at least one of their computer rooms ..... It was particularly useful for language teaching and learning to use IT. The success of utilizing this kind of system contributed much to the establishment of the Multimedia Learning Centre Project for 103 public-sector schools in 1999.”
2. *The commissioning of a consultancy project on IT competencies for teachers*: “The experience and perspective in IT teacher training had been carried forward to a consultancy study on defining the core competencies, course elements for each IT competency level, and the corresponding assessment tools or methods.”
3. *The establishment of administrative guidelines and procedures for the implementation*: “... to establish viable practices including better coordination with the works department on site preparation, award of authorized hardware and software dealers, technical support services as well as teacher training providers to minimize tendering work.” Their experience helped to streamline workflow and management for the territory-wide implementation of IT in education.

#### *3.2.3.5 The impact of pilot schools from a broader perspective*

1. *The establishment of a culture of sharing amongst schools*. It was reported that the initial focus for sharing was mainly on infrastructure, then moved towards practical use of IT in classrooms as well as teacher enablement, curriculum design & human resources deployment.
2. Many commercial vendors also targeted the pilot schools to use them as showrooms, testbeds, etc for their products, and some even ended in setting up joint ventures.

#### *3.2.3.6 Challenges experienced by pilot schools*

The pilot schools were amongst the most “IT ready” schools at the time of establishment of the scheme. They were given a higher level of resourcing and a lot of freedom in the implementation of ICT for teaching and learning. On the other hand, they were bearing the

burden of pioneering without much guidance in all aspects of the implementation. While the key challenge of IT implementation should be an educational one, much of the effort of the key change agents in the pilot schools including the principals and IT coordinators were related to budgetary, administrative and technical concerns. School principals and teachers had to cope with legal and technical requirements such as procurement procedures, structural constraints of buildings, etc. which had seldom been required of them before.

The implementation of IT in education differs from earlier curriculum changes in that it requires heavy and complex infrastructure investment that pervades the entire school premises. The extent of such infrastructure development had generally not been experienced by schools since their establishment. Often school principals and teachers have to tackle problems requiring specialized knowledge that they did not have, and many had to go through a steep learning curve to gain the requisite knowledge. The diversity of solutions developed in the pilot schools is a result of this experimental process. While such diversity may reflect the different contextual situations of schools, it also meant that some of the solutions may not be optimal. The report reviewed a variety of practices, mostly in the area of hardware and infrastructure. However, the report mainly reported on the intentions associated with the different practices but did not include clear indications of whether such practices should be promoted or the conditions and purposes for which these practices should be good models.

Further, unlike general upgrading of school building or maintenance work, this kind of development has not been experienced by all parties involved, including the many government departments involved other than the Education Department. The pilot schools' struggles through the administrative and budgetary maze have helped the ED to establish clear administrative guidelines and procedures, which has benefited other schools. However, it is not clear that they will not be faced with issues of a similar nature when new problems emerge, such as issues related to maintenance and upgrading of equipment.

Based on the achievements and contributions reported, it is apparent that the clearly identifiable achievements are mainly associated the establishment of a good infrastructure for access and connectivity. Teachers were also mobilized and they received various levels of preparation. However, there is no evaluation in relation to how far the aim of using ICT to "improve mainstream practices in schools" has been successful in achieving the educational goals identified in the 5-year strategy. The variety of practices present in the schools represents educationally diverse philosophies. It is not clear from this report which of those should be promoted and further enhanced and which should not be furthered. Here again, the schools are facing the challenge without clear directions.<sup>3</sup>

#### *3.2.3.7 Looking ahead*

The report estimated that the pilot schools are ahead of the other schools by one year in all respects. On this basis, the report also anticipated new issues and problems associated with the natural progress of events to be again fronted by the pilot schools, whether that they wish to or not. One kind of challenge is associated with the aging of equipment and the emergence of newer models. What kind of plans should be in place for sustainable infrastructure development? The report also recommended that these schools continue to be supported so that "they can continue to take up their pioneering role in enhancing teaching and learning through the use of IT".

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<sup>3</sup> Nevertheless, sharing of experiences from pilot schools took place, and some of the associated materials are displayed at the website of HongKongEducationCity.Net.

While expecting the pilot schools to lead in the implementation of IT in education, there has been little directions or guidelines provided to pilot schools since the start of the scheme. At this juncture, the pilot schools seem to be still left in the same situation of having to face the blunt of new challenges without having substantive support beyond the provision of extra resource.

### **3.2.4 Access**

The “evaluation reports” in this category are rather different in nature and address different issues. One document is an internal ED evaluation report on the utilization and management of the ITLC established in 46 prevocational and secondary technical schools (these school labels are no longer valid). Two of the documents were summaries of statistics for a short questionnaire to find out the progress in the establishment of the computer laboratory in prevocational schools. Two of the documents were simple statistics of users visiting youth centers and using the ICT facilities there. There was also a summary of statistics on a questionnaire to find out the provision of IT facilities in schools. The remaining documents were just the survey instruments.

#### *3.2.4.1 Usage of Information Technology Learning Centre (ITLC)*

In November 1999, a survey was sent to all 27 prevocational schools and 19 secondary technical schools that had been provided with an ITLC to find out the utilization of the facilities. The survey received a 100% response rate. 80% of the schools reported an average utilization of more than 3 hours per day and 85% organized activities in the ITLC after school. The reported usage was higher or much higher for the junior secondary levels (S1-S3), taking up 68% of the total reported usage time. The report concluded that the ITLC was justified on the basis of the high reported utilization.

#### *3.2.4.2 Progress in the establishment of computer laboratories (CL)*

This set of documents contain the survey questionnaire sent to the 27 prevocational schools that were each provided with a computer laboratory to find out their progress in the establishment of the computer laboratory as at 30 April, 2000 and 31 August, 2000, and two sets of statistics. The questionnaire was only interested in finding out the procurement status for the computer laboratories and how that progress compares with the status of procurement for the schools under the IT in Education project where each school was provided with funds to top up the number of computers to an average of 82. The response rates for the two mailings of the surveys were 25 and 26 respectively out of 27. As of the end of August 2001, most of the installation for the hardware and LAN has been completed, the procurement for the other items was also mostly completed, with the exception of the inkjet plotter. Only one school reported not having ordered any of the major items.

#### *3.2.4.3 Usage of ICT facilities in youth centers*

Efforts have been made to increase after-school access to PCs and the Internet for children and youth through various community and youth centers. In July and Oct. 2000, two surveys were conducted on usage in these centers. The number of respondents for each of the two surveys were 1, 862 (60 % male, 40 % female) and 1, 439 (64 % male, 36 % female) respectively. Unfortunately, there is no information provided on where and how these data were collected nor what the sample was supposed to be.

The distribution of the respondents' educational levels were reported to be as follows: primary 3 or below (12% in both surveys), Primary 4-6 (36% in both surveys), Secondary 1-3 (26 %; 27 % respectively) and Secondary 4-7 (17 %; 16 % respectively).

The survey results revealed that the peak time for PC access by the respondents was around 3-5 p.m., mostly for a period of 1-3 hours.

#### *3.2.4.4 Provision of IT facilities in schools for parents and public use*

A summary of statistics for a questionnaire titled as above was provided by the ED, dated 13/6/2001. The questionnaire was possibly sent to all public sector schools in Hong Kong and responses were received from 277 secondary schools, 487 primary and special schools. There was no breakdown of the results for the different categories of schools. The survey found that only 54% of schools have experience of opening up their IT facilities of any kind, mostly for IT courses or IT-related activities organized by the school or by the parent-teacher associations. The most popular time for the opening up of facilities for such purposes was the school holidays. In terms of cooperating with the parent-teacher association to provide access to the IT facilities, 91% of the respondents indicated a willingness to extend access to parents while only 16% was willing to extend the access to the wider public. The most often citing enabling factor for the opening up of IT facilities was the support provided by the parent-teacher associations, and the greatest concern expressed against opening up of the facilities for public use were that of security (88%), manning and security (84%) and the lack of human resources (79%).

### **3.2.5 Connectivity**

#### *3.2.5.1 Education specific intranet consultancy study*

##### *Background*

Under Chief Executive's Policy Address on IT education initiatives, the ED commissioned a team of consultants from Hewlett-Packard and the Chinese University of Hong Kong to study the need and options for an Education Specific Intranet from February to October 1999. The study was commissioned to determine whether there was a need for an Education-specific Intranet to be established as a strategic ITed initiative and if so, the appropriate specifications for such.

##### *Definition, scope and framework*

The definition of an Education-specific Intranet was a network of resources serving the local educational community. The Intranet was expected to have two distinctive characteristics: its uses should not preclude access to the Internet and it should be accessible from multiple-channels (including the Internet). Totally, there were five reports were delivered at five successive stages of study: a needs analysis report, an options report, a financial (cost<sup>4</sup> / benefit) analysis report, an implementation strategy report and a final report.

The study used a 6-layered conceptual framework for considering factors in two domains, namely, human and technical ones. Human factors were categorized into three layers: people (culture, attitudes, skills, leadership), process (plan, creativity, management, sharing, application, support, feedback) and structures (organization, governance, rewards, finance, policies). Factors in the technical domain included services (repository, e-mail, bulletin

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<sup>4</sup> The estimated costs were for direct expenditures (non-recurrent set-up costs and recurrent costs for the ongoing operation of the Education-specific Intranet).



boards, tools, forums, web searching), software (educational content and software and application software) and platform (hardware, network, protocols, infrastructure software).

#### *Findings and recommendations*

*Needs for an Education Specific Intranet (ESI).* The report came to the conclusion that there is a need for an ESI to provide support for several key aspects of ITEd implementation: teacher enablement, curriculum resources, resource support and the fostering of a community wide culture. An ESI could be a platform to provide professional support for teachers and for the exchange of teaching experiences amongst teachers, provide support on the access, purchase and evaluation of educational software, extending the learning and support communities beyond the school, nourish a community culture.

*Curriculum resources.* A key focus of the consultancy team was on the provision of educational resources to schools. It was observed that Chinese versions of educational materials were limited and tailor-made resources closely matching the existing school curriculum were very much lacking, thus creating big obstacles to the school-based integration of IT in the curriculum. It was also observed that schools were not effectively producing content, the production was often not attractive, there was a lack of coordination and sharing in IT education and there was no standard for the interoperability of IT teaching resources. Inadequate coordination made it very difficult to determine the degree of IT implementation and the utilization of resources ineffective. It was recommended that there is an urgent need for the continuous collaboration of the school sector with the commercial sector in the publication of educational materials as the former needs support in the production of well-formatted materials and to handle issues related to intellectual property rights while the commercial sector lacks the educational understanding for the production of high-quality educational products. The report also mentioned an urgent need to organize the resources found on the websites of government departments, public companies, museums, public libraries and large corporations over the Intranet. It was recommended that the Intranet could categorize the contents of diverse information sources into a structured interface to produce a content-rich interactive environment. In particular, CyberCampus was recommended as a viable platforms for initiating incentive schemes to encourage teachers to develop their teaching materials to a publishable quality.

*Leadership and pedagogy.* The consultancy team observed that there was a strong expectation from the education community for leadership from the Government on the implementation of ITEd. At the same time, it was observed that there was a lack of structure for the promotion of sharing and coordination among schools. It was also argued that school-based autonomy in implementing ITEd initiatives was limited due to the extensiveness of the school curricula, large class sizes and short timetable periods. It was observed that the pedagogy in Hong Kong schools was mostly teacher-led and that the teacher training on the use of IT in teaching was limited. It was recommended that the process of ITEd implementation should also be a continuous process of paradigmatic shift from traditional teacher-led lecturing to a “telling and explaining” mode supported by effective uses of multi-media (as a transition) and finally to a well-balanced blend of teacher-centred and student-centred strategies.

*People.* The report observed that as the nature of the change was one of bringing about an innovation, strategies should be developed to cater for the different needs of school personnel at different stages of concern about the innovation: awareness, informational, personal, managerial, consequential, collaborative and refocusing.

*Technology.* It was observed that despite increasing levels of connectivity found in the IT pilot schools, the overall accessibility and connectivity found in many schools were still unsatisfactory. The availability of Internet services at the school level was still limited and there was a lack of coordination in this area. It was recommended that Internet connectivity to schools could be greatly enhanced through encouraging more effective competitions in the local telecom-munication market and to make broadband connectivity widely available to schools. It was also recommended that Internet access for students could be extended through providing them with access after school hours as well as through access in youth centres.

*Implementation strategy.* The report explored strategic options and recommendation different strategies for different aspects in the implementation of an ESI. It was recommended that hardware and project funding should be devolved to schools while the development of appropriate educational content should be done through centralized, government directed and commissioned projects. To support collaboration between the business sector and government departments in the establishment of a publishing industry for educational content, it was recommended that a proactive organization was required to coordinate these sectors with schools. The government should provide not only leadership at the centre but also send change agents to schools so that the organizational leadership at the center can coordinate with leaders in the school sector to bring about changes.

The report came to the conclusion that many schools would not be able to reach a high level of maturity in the six dimensions mentioned above in the exploitation of Internet technology in school education within the span of 5 years covered by the ITed Strategy Plan.

#### *3.2.5.2 Report on site preparation for schools*

This is an internal document of the ED providing detailed information about those schools (school name, school code, school type and date of completion) for site preparation.

### **3.2.6 Teacher enablement**

#### *3.2.6.1 Background*

Provision of major IT-training programs was started at the end of 12/1998 and the number of training events rose to the peak in the academic year of 2000-2001.

Content analysis reflected that the Information Technology Education Resource Centre (ITERC) of the Information Systems Division (IS) held the main responsibility for managing the organization of these programs. Apparently, ITERC organized most of the training programs for public school teachers while a number of training programs designed for technical and prevocational school teachers in the commercial subjects were organized by the Technology Education (TE) Section of the Curriculum Development Institute (CDI). Most of the courses were contracted out to IT training providers in the commercial sector though the tertiary institutions also contributed.

#### *3.2.6.2 Levels of IT competence for teachers*

The IT training was delivered through a variety of formats: the existing venues like RTC and INSTEP as well as courses specially tailored for preparing teachers at the BIT, IIT, UIT and AIT levels, with the latter programs targeting specific IT competency levels serving as the main provision of IT training to public sector school teachers. The total number of (half-day) courses and participants since April 2000 and up to June 2001, as reported by the eight vendors, were about 8,000 and 130,000 respectively. These training programs were delivered

in two different modes: centralized and school-based<sup>5</sup>. With the exception of the AIT courses, school-based training was the predominant mode, involving a greater number of participants.

### 3.2.6.3 Summary statistics of teacher enablement programs organized

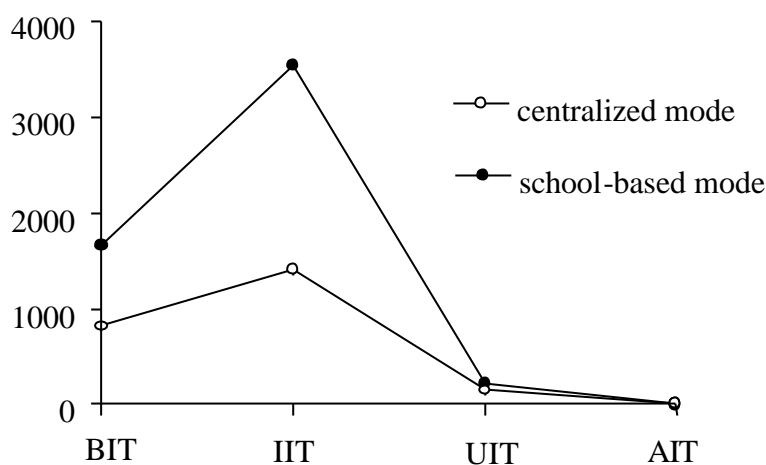


Figure 3.2.1 No. of 1/2 day courses organized

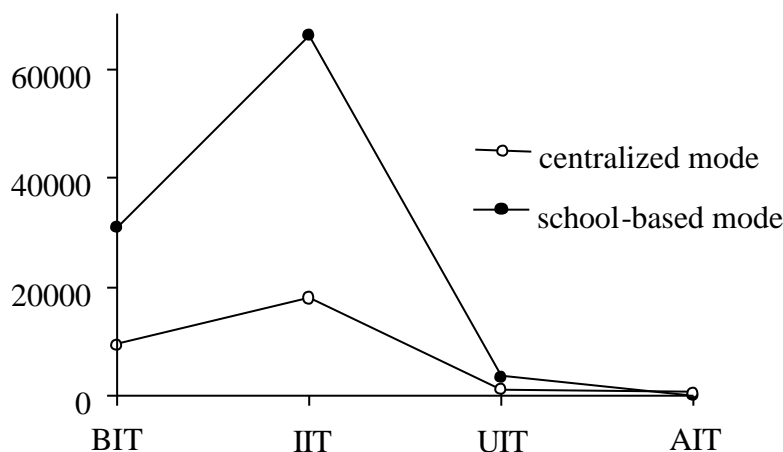


Figure 3.2.2 No. of participants in the various courses.

The foci of the training programs were mainly on computer skills and the use of IT in subject teaching. Courses organized were predominantly skill-based, especially in terms of the training programs provided for primary school teachers. Training on the use of IT for subject integration and in project-based learning were rare.

Regarding training for principals, a two-hour sharing session on how to use educational software for teaching and learning was organized for primary principals in late 1998. Substantial training program for school principals on IT and educational leadership was not evident until 4/2001.

<sup>5</sup> It should be noted that under central training tender, there have been both school-based and centralized courses whereas under the refresher training mode, only centralized ones have been offered.

#### 3.2.6.4 Evaluation of teacher enablement programs

There were two types of documents in this category. One was the course participants' evaluation of the various central and school-based IT teacher training programs organized by the various vendors. The other was reports made by ED staff on class visits to the IT training programs organized by the different vendors.

##### *Participants' evaluations*

The following meta-analysis was compiled by the research team based on the limited number of relevant ED documents. It should be noted that the generalizability of the results is not clear as the team has no clue on the extent of coverage of the participants' evaluations relative to the total number of courses run by the respective vendors.

The participants' evaluations were collected on two kinds of IT teacher training programs. One kind of training was focused on the development of technological skills, and may be conducted in *central* or *school-based* training modes. The second kind of training was on subject-based integration and the reports in the collection analyzed included Chinese History, History, Economics, Geography and Chinese (at secondary level) and Mathematics, Fine Arts and Crafts and Music (at primary level). Usually most technological skills were taught by private commercial sectors whilst some tertiary research centers and community educational institutions shouldered the responsibility of providing subject-based integration courses.

Meta-analysis on the participants' evaluation reports is potentially a good means to find out the overall level of satisfaction of teachers on the different programs and to gauge possible changes over time. Unfortunately, the evaluation forms from different vendors were of different formats and asked questions. Further only summary statistics for each course is given, without access to the raw data. In the end, three common items (either on four-point or five-point rating scales) found in the reports were selected for meta-analysis: the degree at which the course was able to meet the course objectives, the trainers' teaching quality and the effectiveness or usefulness of the course.

To facilitate comparison across courses, all figures not originally measured on a five-point Likert scale (with 5: very good; 4: good; 3: satisfactory; 2: fair; 1: poor) were converted to such from a four-point Likert scale (with 4: good; 3: satisfactory; 2: fair; 1: poor).

Cross-subject comparisons in table 3.2.2 found that courses at IIT were in general perceived to be better than those at BIT. Teacher training courses in Economics had the highest rating for meeting course objectives. Courses on using IT in Music education received the highest rating for courses catering for the primary sector.

Table 3.2.2 Cross-subject comparisons of three trainees' evaluation items.

Uses of IT into Subjects	Levels of IT teacher competency	Levels of schooling	Meeting course objectives	Trainers' teaching quality	Course effectiveness / usefulness
Chinese History	BIT	Sec.	3.00	3.13	3.19
	IIT	Sec.	3.06	2.96	3.27
History	BIT	Sec.	2.81	3.14	3.14
	IIT	Sec.	3.13	3.15	3.27
Economics	BIT	Sec.	2.89	3.22	3.09
	IIT	Sec.	3.23	3.16	3.63
Geography	BIT	Sec.	2.89	3.23	2.99
	IIT	Sec.	3.01	3.24	3.11
Chinese		Sec.	3.05	3.07	2.72
Mathematics		Prim.	3.05	2.71	2.63
Art		Prim.	2.98	2.54	2.96
Art & Craft		Prim.	2.66	2.24	2.65
Music		Prim.	3.29	3.17	3.04

Attempt was made to find out whether there is any noticeable change in participants' evaluation of the courses over time. In general, there were sometimes big fluctuations even for the same vendor on the same kind of course, while a pattern for variation with time was not generally identifiable. However, for some courses offered by commercial vendors, there appeared to be higher ratings over the summer months of July and August compared to other times of the year (see Table 3.2.3). It is not obvious what the cause of such patterns might be. Perhaps the vendors were more able to attract experienced in-service teachers to help them run some of those courses over the summer vacation.

Table 3.2.3 Cross-time comparison of participants' ratings of some training courses on web browsing and emailing for two commercial vendors.

Date	Meeting course objectives		Trainers' teaching quality		Course effectiveness / usefulness	
	Vendor B	Vendor E	Vendor B	Vendor E	Vendor B	Vendor E
Mar-00	3.56	3.37	3.62	3.26	3.43	3.13
Apr-00	3.38		3.36		3.21	
May-00	2.95		3.36		3.11	
Jun-00	3.13	3.14	3.08	3.05	3.07	3.09
Jul-00	3.24	3.27	3.13	3.63	3.11	3.16
Aug-00	3.33	3.22	3.39	3.16	3.21	3.27
Oct-00	3.12	2.79	3.23	2.79	3.12	2.97
Overall mean	3.24	3.16	3.31	3.22	3.18	3.10

#### *Evaluations of teaching made by ED staff on their monitoring visits*

Evaluations of teaching on 45 class observation visits made by some ED staff was included in the set of documents provided. The content of all the classes observed were technologically focused, 20 of these visits were at the BIT level and the remaining 25 at the IIT level. The classes visited were distributed among five commercial vendors and three tertiary sector vendors. There were 6 visit reports for each of these vendors in the collection, except vendor X which had only 3.

Table 3.2.4 Mean rating on the trainers' performance during visits made by ED (IS) staff.

Vendor	BIT courses			IIT courses		
Tertiary Sector	Meeting course objectives	Trainers' teaching quality	Course effectiveness / usefulness	Meeting course objectives	Trainers' teaching quality	Course effectiveness / usefulness
X	3.00	3.50	3.00	Nil	Nil	Nil
Y	3.33	3.00	3.00	3.67	2.67	3.33
Z	3.67	3.33	3.33	3.00	3.33	3.00
<b>Overall mean</b>	<b>3.33</b>	<b>3.28</b>	<b>3.11</b>	<b>3.34</b>	<b>3.00</b>	<b>3.17</b>
Commercial Sector						
A	2.00	3.00	2.00	2.33	2.40	2.60
B	2.67	2.67	2.67	3.33	3.33	3.00
C	2.50	2.50	2.50	2.50	2.50	2.00
D	3.00	4.00	4.00	3.20	2.40	2.80
E	1.00	1.50	1.00	3.25	3.25	3.25
<b>Overall mean</b>	<b>2.23</b>	<b>2.73</b>	<b>2.43</b>	<b>2.92</b>	<b>2.78</b>	<b>2.73</b>

As can be seen from Table 3.2.4, the quality of training was generally rated to be higher for those offered by the tertiary sector, especially for course at the BIT level. Further, it is observed that the evaluation rating across the commercial vendors was much more widely distributed than those across the tertiary sector vendors. The fact that the BIT courses from vendor E received a mean rating of "1" for meeting course objectives and for course effectiveness and a mean rating of "1.5" is a cause for concern. Unfortunately, it is not clear from the documents what uses have been made of the results from these monitoring visits and how these visits contribute to better teacher enablement programs.

#### 3.2.6.5 Teacher enablement programs for technical and commercial subjects

In addition to the provision of CL and ITLC to the former prevocational and secondary technical schools, the Technology Education section of the CDI also provided teacher enablement opportunities to teachers in those schools to help them make use of the facilities provided. One of the document reporting on the training and sharing sessions organized on using ITLC, four 2-hour sharing sessions were held for a total of 200 participants, held between Feb. 1998 and Oct. 1999. In addition, 41 in-service training courses with 25 different course titles were organized for a total of 812 participants. Some of the courses were repeated up to 4 times, and the duration of these courses ranged from 3 to 90 hours. Topics covered included basic skills in computer literacy as well as the integration of IT into the teaching of individual technical and commercial subjects.

In relation to helping teachers in the 27 former prevocational schools to make use of the CL provided, efforts included a 2-hour sharing session for 27 in-service teachers in Dec. 2000, 5 courses on 'Teaching of Information Technology S 4-5' and 3 course on 'Teaching of Graphical Communication S 1-5'. These two courses lasted 39 and 24 hours each, attracting 130 and 117 teacher participants respectively.

#### 3.2.6.6 Teacher enablement status

Public sector schools have been asked to report on the status of IT competency level reached by their teachers. The summary statistics up to June 2001 is as follows:

Table 3.2.5 Status of schools in having their teachers reaching the BIT level of competency up to June 2001.

Status reached	Primary sch.	Secondary sch.	Special sch.	Total
100 % or nearly 100 % attained BIT	650	396	71	1117
Less than 100 % attained BIT	37	16	1	54
Have not submitted progress	11	24	1	36
	698	436	73	1207

It is clear that most schools have reported that all their teachers have reached the BIT level, according to the returned forms.

### 3.2.7 Resource support

The Information Technology Coordinator Scheme was first implemented in 1999 to provide an additional teacher to 120 schools (61 secondary, 53 primary and 6 special). An evaluation report on the progress and effectiveness of this first phase of the scheme as well as the additional teachers provided to the 20 pilot schools was completed by officers and seconded teachers of the Regional Support Section in February, 2001. The study used two methods of data collection: questionnaire to all 120 schools allocated ITCs and visits to 24 of these schools as well as 2 pilot schools. The time for data collection was from Oct. to Nov. 2000. For the questionnaire study, each school was required to return questionnaires from 7 respondents: the principal, the ITC and 5 non-ITC teacher.

#### 3.2.7.1 Roles of ITCs

The 6 specific roles listed for ITCs can be divided into 3 groups:

1. resource planning and management (budgeting, procurement & management of resources),
2. technical support to fellow teachers,
3. supporting and coordinating IT implementation, which includes organizing IT training, suggestions on applying IT in teaching and sharing experience with other schools.

#### 3.2.7.2 Objectives of the ITC scheme

The stated objectives of the ITC scheme were:

1. To assist schools to develop and roll out an effective school-based IT education plan catering for the specific needs of their students;
2. to promote more frequent applications of IT for teaching and learning as well as extra-curricular activities; and
3. to help foster a culture within the school in using IT across the curriculum and add value to the quality of education.

#### 3.2.7.3 Contributions of ITCs

In terms of the 6 specific roles of ITCs, the questionnaire results showed that ITCs were most valued for planning and organizing training as well as for the technical support they provide. Their role in coordinating across subjects has been found to be less effective, especially at the secondary level where the perception of the role of IT in education is more sophisticated and tend to go beyond the production of courseware.

It appears from the evaluation findings that the first category of roles is considered to be important and generally satisfactorily performed by ITCs from the school heads' responses.

This category of roles will still be important, though possibly receding somewhat due to the completion of the major infrastructure projects.

The role of ITCs in providing technical support has also been greatly appreciated generally by both school heads and teachers, though the rating by the latter tended to be not as highly favourable as those from school heads. With the provision of designated technical service support, this role for ITCs is getting less important as well. This shift in role is also reflected in the planned tasks of the ITCs for 2000-2001 from the questionnaire responses.

The third category of roles clearly has the closest relationship to promoting the adoption of technology for teaching and learning and changes in teaching practice. This category is also reported to be the most important area for development for 00-01 in the survey. However, this also an area that has not received as positive a rating as the other two aspects.

It was reported that in the period up to the time of the evaluation, the ITCs were most heavily engaged in setting up the school infrastructure, ensuring the proper functioning of the school network through securing technical support services and the management of resources. Another component of the ITCs' work was in organizing training for teachers. While it was reported that school-based training was often organized for money-saving purposes, it was unanimously welcomed by teachers and found to be effective.

On the whole, ITCs were more highly valued and relied on in primary schools as compared to secondary and special schools. This was attributed to the lack of IT-literate personnel in primary schools. It was reported that ITCs in primary schools played a more direct role in supporting IT integration in teaching through giving advice on courseware preparation, purchase as well as participation in the collaborative production of courseware.

#### *3.2.7.4 Modes of organizing IT coordination*

The most popular mode of organizing IT coordination in schools was to use a team approach where the additional teacher provided by the scheme took up the team members' teaching load. Often, the ITC team members were from the science disciplines. It was also reported that the ITC teams worked best in promoting the use of IT across the curriculum if there were senior staff such as the vice-principal to head the team.

The functions of ITC team members included the coordination with subject panels on integrating IT in the curriculum, the setting up of the school intranet and courseware management system, the introduction of relevant software, useful URLs and IT opportunities available in the community as well as to bid for resources from QEF. In primary schools, ITCs were also providing direct assistance to their colleagues in terms of operating IT facilities and the preparation and use of IT-based courseware.

#### *3.2.7.5 Evaluating the extent to which the goals of the scheme were achieved*

A large majority (87.5%) of schools reported having implemented the IT plan as submitted in their ITC applications. Two reasons were given for not having implemented the plans: there were delays in setting up the IT infrastructure and the lack of sufficient human resources to carry out the tasks scheduled. However, nearly all schools reported having completely achieved (42%) or mostly achieved (56%) the stated goals of the scheme by the end of the scheme. The only 2 schools that reported not achieving most of the objectives attributed the failure to the teachers' low IT competency and insufficient human resources.



#### *3.2.7.6 The future of the ITC scheme*

All of the principals surveyed wanted the scheme to be continued upon expiry of the 2-year scheme at the end of the 00/01 school year. Eighty schools suggested an extension of the current scheme, 25 schools suggested making the ITC a permanent establishment while 15 suggested that this should be extended in the form of a cash grant. The adverse impacts of not continuing the ITC scheme quoted by the school heads were that IT development and teacher training would slow down for lack of additional support and lack of resources to introduce new IT resources or experience sharing. Other negative impacts mentioned were in the areas of management of infrastructure and IT resources, curriculum development, IT culture and the increase in workload for teachers. The school heads also supported extending the ITC scheme to other schools for reasons that echoed the role that ITCs have taken up within the scheme.

When teachers were asked about the likely impact of the termination of the ITC scheme on them, the responses were similar to those from the school heads with the additional comment that they may lose confidence in using IT.

When asked for measures that the school heads would take if the ITC scheme were not to be continued, some indicated that they would use the schools' own funds to establish an ITC position. Unfortunately the report did not indicate the percentage of school heads making such an indication.

Based on the findings, especially through observing the changing roles of ITCs in pilot schools, the report made the observation that management and procurement of resources, including making QEF proposals, would still be key tasks for ITCs in the coming months though their role in supporting use of IT in teaching and learning is expected to increase. The latter is expected to be in the form of setting up the school intranet and course management system, the introduction of useful URL and software, supporting colleagues in the production of courseware and as well as working out with subject panels the percentage time of using IT in the curriculum, besides the provision of support to individual teachers when necessary.

#### **3.2.8 Summary**

It appears that there were three types of documents in this category: commissioned studies, simple surveys and two more in-depth internal evaluations involving surveys and school visits, one on the IT Pilot Scheme and the other on the ITC Scheme. In summarizing this chapter, an effort is made to explore what the foci for these different types of monitoring and evaluation efforts are and what impact these have made on the implementation process.

There were three major commissioned studies reviewed in this chapter, all of which were intended to provide input to subsequent implementation strategies: the "Usage of IT in Schools" report completed in November 1998, the Education Specific Intranet Consultancy Report completed in October 1999 and the Levels of IT Competency and Assessment Study completed in November 1999. These reports were all conducted by teams of experts and their findings should definitely be taken seriously, both by the government and the public, especially educators working in schools and other institution. Unfortunately, only the recommendations from the last report was made public in the form of seminar presentations. This means that there is little opportunity for the education community to become aware of the findings and to discuss the appropriate policy implications. It is also observed that some of the recommendations from these reports were taken up by the government. However, it is not obvious if there is any specific guideline or basis for selecting or prioritizing which of the

recommendations need to be implemented. In reviewing these three documents, there are some recurrent themes in these reports which do not appear to have made much impact on the government's ITed policy implementation, especially those related to leadership and paradigm shift.

The HKIED '98 report recommended that principals should be given support to empower them with sufficient knowledge to play a key role in the promotion of IT in schools. The report also pointed out that principals need to provide on-going vision and leadership in the development and implementation of new learning technology plans. The ESI report also noted that schools were very much looking to the government for leadership and that the pedagogy in schools was still predominantly teacher-centered lecture style processes. The same report also mentioned that the nature of the change is one of implementing an innovation that requires fundamental changes in teachers' understanding and their practices, thereby recommending that the change process should cater for the varying needs of teachers while bringing them through more advanced stages of concern. Implicit in these recommendations is the understanding that to bring about the paradigm shift for achieving the aims listed in the 5-year ITed strategy, schools need to undertake a curriculum and pedagogical reform. Unfortunately, very little had been done in these crucial areas. Efforts are only just beginning to be made to provide training for principals and mainly on the technical aspects of IT implementation. There is no support given to principals to help them understand the nature of the change that they should be leading and how to carry out their role as leaders of reform and possible strategies to implement change at the school level. The teacher enablement offerings were categorized under varying levels of technical competence and the training specifications did not reveal how the different courses might cater for teachers with different stages of concern or even that the courses on subject integration should promote certain curriculum and/or pedagogical priorities.

The second type of documents within this category comprises the two in-depth internal evaluations conducted by a sizeable team involving surveys and school visits, one on the IT Pilot Scheme and the other on the ITC scheme. These two reports were informative in terms of describing the situation and perception in schools. Both reports revealed that schools in these two schemes have generally made great efforts towards the implementation of ITed. The pilot schools' struggles through the administrative and budgetary maze have helped the ED to establish clear administrative guidelines and procedures, which has benefited other schools. However, experiences of the schools in the ITC scheme in general revealed that most of their energies were used up in the procurement and management of resources and most of these schools have completed their infrastructure works and installations. The practices in both sets of schools are rather diverse and the reports do not reveal evidence of which of these practices were more closely aligned with the aims of the 5-year strategy. Both reports also highlighted issues related to the future directions for schools in these two schemes and it is important that these be followed up seriously beyond logistics and funding.

The greatest number of documents reviewed in this chapter is internal documents resulting from efforts to monitor the status of implementation in quantitative terms. It is commendable that such efforts should be made. However, it appears that there is no overarching coordination and very little attention paid to the design and the reporting such that these cannot be much more than piecemeal, anecdotal information. It is recommended here that the Education Department should make efforts towards building up good knowledge management strategies within the department so that each piece of information coming in can help to build

up a better understanding of the overall situation by everyone to inform policy and practice and not just the team that collects the data.