CHAPTER 3.4 EXAMINING SCHOOL EXPERIENCES ASSOCIATED WITH INNOVATIVE PEDAGOGICAL PRACTICES

Quantitative data collected through surveys and document analysis would only provide us with general pictures of implementation. In order to find out what actually happens in classrooms when IT is introduced and how schools manage the change process, the use of in-depth case studies including classroom observation would be a very valuable approach, especially if we are looking for evidences of new curricular and pedagogical approaches that may emerge with the introduction of new technologies. This chapter summarizes the findings from two sets of case studies conducted by CITE in the second half of the 98/99 school year and in 00/01. In writing up this summary, we would like to illuminate in particular the question of whether the governmental vision of developing "in our students the attitude and capability for independent life-long learning" and hence "become more motivated, inquisitive and creative learners" (Education and Manpower Bureau, 1998) has been achieved by the use of IT in schools, and what school level factors determine the success of these schools in achieving these goals. These case studies will hopefully also throw light on what actually happens when the schools and teachers "take up the challenges of their respective new roles" (EMB, 1998).

3.4.1 Case Selection Criteria

The sampling for the two sets of case studies was different. The first set was conducted as part of the local component of SITES Module 1 and these were case studies on "good practices" on IT usage. The cases were selected through recommendations of steering committee members, Education Department officials and others, based on the fact that they were "good" practices as perceived by some members of the education community. In other words, there were no specific criteria imposed on the features of the practices selected apart from the fact that they used IT. This was necessary as most schools were only in the early stages of integrating IT into education. In contrast, the case studies in module 2 were conducted as part of an international comparative study and were selected on the basis of a set of internationally agreed criteria in order to qualify as "Innovative Pedagogical Practices Using Technology" (IPPUT). One of the selection criteria, namely the criteria for innovativeness, would be adapted according to criteria set by the local Steering Committee. The IPPUT selection criteria were:

1. That shows evidence of significant changes in roles of teachers and students, the goals of the curriculum, assessment practices, and/or the educational materials or infrastructure. These changes should relate to the "innovativeness" criterion addressed below. The evidence for this change might systematically document the previous practices and roles and compare them with those associated with the introduction or development of the innovation. Or the evidence might show how the practices in this classroom are significantly different from those in typical classrooms in the country M2 event in which technology plays a substantial role.

2. Technology should not merely replace previous practices but make a significant contribution to change. Technology may make a contribution by providing specialized tools or capabilities that support learning (such as simulations, scientific visualizations, multimedia, or communications) or by providing a "Trojan Horse" by which other changes are delivered. In any case, the technology should provide an added value to the pedagogical practice and this contribution should be articulated clearly.

3. That shows evidence of measurable positive student outcomes. There should be some kind of documentation that shows that the intended goals and objectives were attained or that shows a desirable impact on an important indicator, such as student learning, enrollment or completion rate, etc. This evidence might be formal evaluations (if such exist), quantified data that demonstrates positive change (e.g., increased achievement scores, diminished gaps in achievement between groups, increased enrollment in rigorous courses, increased graduation rates, etc.), or in-depth qualitative data, such as systematic analysis of student products compared with previous products. In general, multiple forms of supporting evidence would make a stronger case than a single form.

4. That is sustainable and transferable. The emphasis here should be on sustainable and transferable. It is an important goal of this study to identify innovations that are sustained and transferred. But because they are innovations, their sustainability and transferability may not yet be proven. Rather, there should be evidence or reasons to believe that they are able to be sustained and transferred. "Lighthouse cases" are a special consideration. In some countries, schools are set up with special resources or training, or special teachers, or reduced classes in order to test out new and promising innovations that, if successful, will be transferred elsewhere. These schools and classes should be considered for inclusion. However, it will be necessary to make an argument for these schools that the innovations that are proven to work here will work elsewhere, or that the special resources, training, etc. that were provided for these schools will be provided to others as the innovation is transferred. What should be excluded are schools or classrooms where success is dependent on a charismatic teacher or administrator, or a special set of resources, or a special group of students or economic factors that are not likely to be reproduced elsewhere.

In addition, the practices have to be innovative, and the Hong Kong SITES M2 Steering Committee have selected the following list as criteria for innovativeness (the practice does not need to satisfy all of the criteria, but it should satisfy at least one of them):

1. Promote active and independent learning in which students take responsibility for their own learning, set their own learning goals, create their own learning activities, and/or assess their own progress and/or the progress of other students.

2. Provide students with competencies and technological skills that allow them to search for, organize, and analyze information, and communicate and express their ideas in a variety of media forms.

3. Engage students in collaborative, project-based learning in which students work with others on complex, extended, real-world-like problems or projects.

4. "Break down the walls" of the classroom—for example, by extending the school day, changing the organization of the class, or involving other people (such as parents, scientists, or business professionals) in the education process.

5. "Break down the walls" of subject areas and promote cross curricular learning

6. Address individual difference

7. Provide students with individualized self-accessed learning, customized to meet the needs of students with different entry levels, interests, or conceptual difficulties.

8. Address issues of equity for students of different genders or ethnic or social groups and/or provide access to instruction or information for students who would not have access otherwise because of geographic or socioeconomic reasons.

9. Improve social cohesiveness and understanding by having students interact with groups and cultures that they would not interact with otherwise.

3.4.2 Research Method

In each case study, the focus was on examining the following:

- What classroom practices were involved in these cases, and what impact they had on student learning; and
- What school level factors contributed to the success of these innovative pedagogical practices.

To obtain data on these aspects, an in-depth approach was taken, which involved a series of classroom observations, interviews with classroom teachers and students in the class as well as an examination of documents pertaining to the teaching practices studied. In addition, interviews were conducted with the principals and the IT team members. Relevant school documents were also examined, including:

- School goals and missions.
- School development plan and/or year plan
- School annual report.
- School vision and policy related to IT in the school and the IT implementation plan.
- School ICT infrastructure.
- Staff development plan for ICT.

It is interesting in that the case studies obtained in module 1 (Law et al., 1999) had certain distinct differences from those in module 2 (to be published). In module 1, most of the case studies related to an expository approach to learning; there were limited opportunities for students to participate in the learning process actively. In particular, as is found in the majority of schools today, "A change in the teacher-learner relationship was not prominent on the agenda" (Law et al., 2000).

3.4.3 Use of IT and Roles of Teachers and Learners

The M1 case studies reveal that there can be very different visions of the role of IT in education amongst the teachers exhibiting "good practices" in the use of IT. The following excerpt from Law et al. (2000) is noteworthy:

> *"It was observed that in parallel with the introduction of ICT into the classroom, some teachers were also taking the opportunity to implement teaching approaches that were changing the roles of teachers and students in fundamental ways. Traditionally, the teacher plays the role of the knowledge expert and the pedagogical expert, presenting content, assigning learning tasks and evaluating learning outcome for students. In expository lessons, this relationship between the teacher and the learners have not changed. However, this relationship is changed to different extents in the other approaches.*

It was found that the teachers we met in the various case studies were excited about the use of ICT for very different reasons and such differences contribute largely to the observed differences in their classroom practices. Some teachers believed that ICT has great potentials in providing much more interactive and interesting teaching aids that make lessons more engaging and more easily understandable. These teachers generally spent a lot of efforts in developing multimedia teaching aids and sourcing good demonstration software and CAL materials. A change in the teacher-learner relationship was not prominent on the agenda and the expository approach was the obvious choice. On the other hand, some teachers saw in the introduction of ICT a different future for education. First of all, information becomes much more accessible and volatile such that the key problem for education becomes one of knowing how to access, evaluate and make use of information effectively rather than mastery of particular content. Secondly, the rapid advances in knowledge force everyone to become lifelong learners in order to keep abreast with developments. Thus we need to provide opportunities for students to become effective autonomous learners: to be able to define their own learning problems, learning needs and to devise a learning plan to achieve the goal. To achieve this requires a change in the roles played by the teacher and the students. Thirdly, a major impact of ICT is derived from the multiple channels of communication for all kinds of media available for concerning to different parts of the world. Individuals and businesses alike would not be able to survive if they cannot communicate with different people using a variety of communication media and technology effectively for different contexts and purposes. For this latter group of teachers, the design and implementation of productive learning activities that required students to make use of information and communication technology in the completion of learning tasks became their priority. Their role as a teacher was also changed in this process."

Law et al. (2000), p.171-172.

A prominent common feature that emerge from the M2 cases studies is that the teachers involved have a clear understanding of their role as a facilitator and are excited about exploring and taking up that role. They are also quite willing to adapt their practices to suit the students' needs and look for the new learning outcomes. Therefore, quite often they would deliberately not provide knowledge as in the hitherto prevalent paradigm of the teacher as the knowledge giver, explainer and learning resource provider. Rather, they would provide students with the opportunity to explore and learn, sometimes on problems that the teachers do not have the answers to.

3.4.4 Emerging features of Innovative Pedagogical Practices Using Technology (IPPUT)

There are some prominent similarities across the set of IPPUTs studied in M2. These similarities in fact echo and accentuate those features found in the M1 cases where role changes in the teachers and students were observed.

Many of the IPPUTs studied in M2 involved project-based or task-based learning approaches. While these practices were initiated by the class teachers themselves, these generally provide a lot of room for the students to develop the specific details of their project and the students were allowed a long period of time to engage in self-directed work. The project work done in such ICT-enabled projects is quite different from that of traditional project work. Whereas traditional project work required students to investigate a well-defined research question within a short period of time (a few weeks), with a title often set by the teacher, and with summative assessment modes being employed, which are conducted entirely by the teacher.

In other words, the traditional project assessment does not assess or value the process of learning and only the product of the learning is assessed. In contrast, the project work found in these IPPUTs often required collaboration with others – both inside and outside the school – and it was often more extended in nature, both in terms of the length of time involved and the open-ended nature of the project. Typically, students would be given an ill-defined research question, and would be subjected to formative assessment by both the teacher and their peers. Whereas traditionally the projects would demand more in terms of information search skills through the use of libraries, in this case we find that the students were required to find information through the Internet, and were required to be more analytical, and reflective skills were often required as well.

Another distinctive feature of the IPPUTs is that the students participated in the determination of their learning goals. They were often given freedom to define their learning goals, which is also a consequence of the more open, ill-defined and authentic nature of the problems that they were tackling. This also led to the students' greater sense of ownership of their learning. Apart from gaining specific content knowledge, students learned how to approach, learn and think about their problems, plan ways of solving the problems, determine their own learning needs in terms of knowledge and skills, arrive at a conclusion based on the results of their learning, and to present their own work.

Another feature was that learning was not confined to the classroom only – it could occur outside it, and indeed outside the confines of Hong Kong as well. It also was connected to the outside world in the sense that people outside the school were also involved. Students collaborated with members of the wider learning community, and a social constructivist approach was often adopted.

Another emergent feature of the IPPUTs are that many of these involve "productive" learning tasks where the "products" of the students' learning in fact contributes to the community, even if in small ways.

Schools were also willing to share their teaching materials and experiences with other schools, and were open-minded to change. Indeed, the teachers considered that these practices were transferable to other schools provided that the teachers were willing to undergo the necessary paradigm shifts and had the necessary (often very basic) competencies and material conditions.

One key question that must be asked therefore in this case is: what school level factors enable these schools to achieve the vision as stated in the five-year strategy (Education and Manpower Bureau, 1998)?

One key common feature of these schools is that the principal has a very clear vision on how education should be carried out. They have a very clear perception of what the role of technology should be in schools and what the ultimate objective of the implementation of IT is in schools. Indeed, they either act as a visionary leader in the school or, more frequently, they act as facilitators and support ideas, although they would not interfere with the practical implementation of the classroom activities.

3.4.5 Summary

The M1 case studies reveal that most of the practices studied did not involve a change in the role of the teacher. While paradigm shift was a jargon embraced by everyone, it was

generally understood as technologizing the process of education and as related to curriculum or pedagogical reforms. The report in fact pointed out a weakness in the 5-year ITEd Strategy document that may have contributed to such an outcome:

> *While the Strategy document highlighted the need for schools to undergo paradigm shift in the implementation of ICT, the meaning of paradigm shift was merely described as changing* ***"from a largely textbook-based teacher-centred approach to a more interactive and learner-centred approach".*** *The advantage of such lack of specificity was that no one challenged this claim, as everyone can easily interpret its essence as consistent with his/her own understanding. Many of the teachers and principals in the study actually interpreted the key components of the shift as to reduce the reliance on textbook-based teaching to teaching with interactive multimedia enriched classroom presentations. Within such a definition of paradigm shift, schools taking a technological adoption approach to change are also making paradigm shifts even though the goals of education and the roles of the teachers and learners remain unchanged.*
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> *The meaning of paradigm shift was not only inadequately described in the Strategy document. The document was in fact not consistent in terms of the key demand on teachers that would be fundamental to their ability to undergo paradigm shift. While the examples of paradigm shift involving use of ICT included in the document were describing pedagogical and curriculum changes as the key characteristics for these cases, the levels of competence described in the chapter on Teacher Enablement was predominantly concerned with the teachers' technological competence. The "competent" teachers were characterized as having the capability to* ***"make more advanced use of authorware for lesson preparation, etc."*** *and the "creative" teachers as those who can* ***"design instructional materials with use of IT and choose appropriate IT equipment to meet a school's needs"****. Such characterizations led to the provision of rather technologically focused training courses to teachers and a reinforcement of the understanding that the essence of ICT in education is in fact an "automation" of traditional modes of teaching and learning with technology and media. It is thus not an accident that while schools in the current Study were all supportive of and committed to the implementation of ICT in the school curriculum, most of the lessons observed were expository and most of the schools perceived the nature of the change as one of technological adoption.*
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> Law et al. (2000), p.177.