The Second International Information Technology in Education Study
Hong Kong SAR Report


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SITES Hong Kong Study Centre
Centre for Information Technology in School and Teacher Education
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The Study is indebted to the Steering Committee for the Hong Kong Study:

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Executive Summary

Research Background

The Second International Information Technology in Education Study (SITES) is an international comparative study carried out across twenty-six countries and regions. The research project is conducted under the auspices of the International Association for the Evaluation of Educational Achievement (IEA). The Hong Kong component of SITES is coordinated by the Centre for Information Technology in School and Teacher Education (CITE) at the University of Hong Kong and funded by the Quality Education Fund (QEF).

Research Objectives

The study aims to collect information on the application of information and communication technology (ICT) in school education for international comparison. This includes ICT-related curriculum goals and its level of implementation, the availability of hardware, software and network facilities in schools, staff development, the organization of ICT coordination in schools and difficulties encountered. The research also focuses on how teachers and students use ICT in teaching and learning both in school and at home, as well as their self-evaluation of their own ICT competence. Results from the research will serve as reference for school principals, teachers, policy-makers, professionals and educational institutions, and provide a basis for in-depth discussion of the development of ICT in education in Hong Kong.

Research Tools, Sampling and Data Collection

SITES has designed four types of questionnaire for the research: the Principal Questionnaire, Technology Coordinator Questionnaire, Student Questionnaire and Teacher Questionnaire. We distributed the first two types of questionnaires to all the schools which use ICT for teaching and learning and obtained a response rate of 74% (317 copies) from secondary schools and 70% (218 copies) from primary schools. We then selected 60 schools from among the respondents to our initial survey and sent them the Student and Teacher Questionnaires. The return rate for the Student Questionnaire was 92% (1646 copies from P6, 2238 copies from S2, 2281 copies from S4 and 1702 copies from S6) and 72% for the Teacher Questionnaire (1398 copies from primary school teachers and 2370 copies from secondary school teachers). The International Steering Committee stipulated November to December, 1998 to be the data collection period for the Principal and Technology Coordinator Questionnaires. Data collection for the Student and Teacher Questionnaires was conducted in February 1999.

ICT-related Curriculum Goals and Pedagogical Practice Paradigms

Many countries have already drawn up their master plans for the development of ICT in education, the emphasis of which is to develop in the younger generation, the competencies required of citizens of the information era. This includes: the capabilities for life-long learning, (such as taking control of one's own learning, setting one's own learning goals and paths, and monitoring learning progress), the ability for autonomous learning and to engage in open-ended learning tasks which involve collaboration and communication with peers and experts. New pedagogical practices, such as innovative ways of organizing classroom learning, new roles for teachers and improved evaluation procedures, are hence indispensable for the attainment of these new goals. One of the emphases of SITES is therefore to understand the impact of ICT on the overall development of school curriculum, and to investigate if any pedagogical practice paradigm shift has emerged during the process. As this research focus is unprecedented in any international comparative study, the definition of an "emerging paradigm" is still in its initial exploratory stage. In the present study, an emerging paradigm is understood as the educational goals to develop students' capacities for self-learning, problem-solving, information seeking and analysis, critical thinking and the ability to communicate, collaborate and learn via the Internet.
Responses from the Principal Questionnaires reveal a strong correlation between the use of ICT and the school and classroom cultures of that country. The policy goal of having "teachers use computers for instructional purposes" gained greater significance in Hong Kong, Belgium, the Czech Republic, France, Israel, Italy, Japan, Singapore, South Africa, Thailand and Slovenia. Canada, the Scandinavian countries and most of the European countries participating in the study, on the other hand, focus more on enabling students to use computers as supportive learning aids. They have chosen to cultivate in their students the ability to "process and analyze information", "use e-mail for communication" and "gain access to external databases via the Internet" as their policy goals.

Both in Hong Kong and across all countries, the prevalence of emerging pedagogical practices in classes using ICT is higher than that in other classes, indicating promising beginning of a pedagogical paradigm shift. In secondary schools, the overall median for the presence of 'student-centered pedagogical practice' is close to 0%, while the median for such practices realized through ICT approximates to 20%. Large dispersions, however, are found among Hong Kong schools regarding the prevalence of ICT-realized pedagogical practices, with the percentages of using ICT to implement 'student-centered practice paradigm' ranging from 0% to 100% among schools. Better communication and coordination among schools regarding the use of ICT in teaching and learning will expedite the paradigm shift in pedagogical practices.

![Figure 1](image)

*Figure 1*

_The present situation of secondary and primary schools in HK adopting “student-centered pedagogical practice” and the situation realized through the use of ICT_
Executive Summary

Student: Computer Ratios and Computer Peripherals

The highest provision of computer facilities are found in Canada, New Zealand, Singapore and Norway, with student:computer ratios of 18:1 or lower. The Russian Federation, most of the East European Countries, China Taipei, Hong Kong and Japan reported relatively higher student:computer ratios at both primary and secondary levels. In Hong Kong, the ratio is 36:1 in secondary schools, and 53:1 in primary schools. In terms of the quality of the ICT infrastructure, Singapore and Hong Kong stood out as the school systems equipped with the most sophisticated computers, where more than 80% of their computers were installed with powerful processors, operating systems and multimedia capability. For most other countries, the average percentages of computers with multimedia capability were only about 50%, 40% and 25% at the primary, lower secondary and upper secondary levels.

Regarding computer peripherals, Hong Kong has an exceptionally high availability of video projectors and LCD panels, both being above 50% for secondary schools, compared to the international averages of 30% and 15% respectively. These findings reflect that Hong Kong teachers tended to use computers for whole class teaching through multimedia presentations. Moreover, none of the 510 primary and secondary schools surveyed were equipped with peripheral devices for disabled students, while out of the 25 special primary schools surveyed, only four have such devices installed. The results pointed to the need to boost the use of IT to assist students with special needs in Hong Kong.

Networking and Communications

The majority of the schools surveyed do not have their computers connected to a local area network. Only 17%, 33% and 34% (compared to the international averages of 42%, 52% and 57%) of the computers in primary, Lower secondary and upper secondary respectively were connected to local area networks, ranking Hong Kong relatively low on the international scale.

The Internet is a powerful learning tool. However, Hong Kong's primary schools have one of the lowest rates regarding Internet connection (10%) when compared to other countries (international average is 59%). Worse still is that among the 218 computer-using primary schools surveyed, of those school that does not yet have the access, 34% of them have no plans to install Internet facilities before the year 2001.

Software Provisions and Pedagogical Applications

Compared to other countries, Hong Kong schools have less variety in their provision of computer software, most of which were designed for general use instead of subject-specific teaching purposes. The majority of school principals and technology coordinators consider the lack of teaching and learning software the main obstacle in promoting the use of ICT in education.

Moreover, among the primary and secondary school teachers surveyed, less than 10% have conducted computer-mediated learning activities in either computer rooms or classrooms. Only about 10% of the sampled schools reported that their teachers have used e-mail or the Internet for teaching purposes.

Staff Development

In the survey, most school principals point out that teachers' lack of ICT knowledge and training are the major barriers to ICT development in schools. In addition, over half of the technology coordinators considered the low quality of the existing ICT training provision for teachers at primary, junior secondary and upper secondary schools the main obstacles to ICT development. The research also finds that most teacher training courses focus on basic computer operations rather than advanced computer skills and subject-specific pedagogical applications.
Technology coordinators, in particular those in primary schools, proclaim lower confidence in their ICT pedagogical competence than technical competence. Compared to other countries, primary school technology coordinators in Hong Kong demonstrated a lower self-confidence both in the application of ICT and the use of Internet in schools, while technology coordinators in secondary school proclaim lower confidence in the appropriate integration of ICT in teaching and learning.

Teachers in Hong Kong generally felt that apart from word processing, they had not received sufficient training to enable them to integrate ICT into their teaching. Training most requested by teachers includes using multimedia in teaching (about 66%), word processing (about 57%), designing and writing software for teaching purposes (about 51%). This indicates the teachers' preference for using ICT as a teachers' tool.

**Strategies for the Implementation of ICT in Schools**

In Hong Kong, only 39% of the primary school principals and 42% of secondary school principals indicated that their schools had drawn up an explicit ICT policy plan, a relatively low rate compared to the international averages of 52% and 50% respectively. The most common component in the ICT policy of the schools in Hong Kong concerns staff training and development. Items like Internet policy and equity of access to use computers in primary schools, and the policy for the application of ICT in teaching for the current and future school year in secondary schools, were less found in Hong Kong than other countries. In general, primary and secondary school principals in Hong Kong have positive expectations for the implementation of ICT in education, even though their enthusiasm about average or relatively low compared to that of other countries.

In terms of administrative usage, Hong Kong reached the international average, with more than 70% of primary schools and 80% of secondary schools using computers both for keeping students' records and monitoring their progress and for managing school resources. However, the use of computers to manage library resources was lower in Hong Kong’s primary schools than in other countries.

**Organization of ICT Coordination in Schools**

According to result of the Principal Questionnaire, only 7% of primary schools and 9% of secondary schools revealed that they did not have any one responsible for the coordination of ICT in schools, while most of the surveyed schools have teachers or committees involving teachers to coordinate ICT work. More than 48% of the principals indicated the presence of an ICT coordinating team consisting of an average of five members in their school. 12% of the surveyed principals also reported the involvement of school principals or senior administrative personnel in the coordination of ICT in their schools. Furthermore, the employment of a full-time technology coordinator was reported by 15% of primary school principals and 8.4% of their secondary counterparts.

Results from the Teacher Questionnaire revealed that 7% of the primary and 6.3% of the secondary school teachers participated in the coordination of computer hardware and software in their school. 11% of primary and 13% of secondary school teachers have also assisted their colleagues in using ICT in teaching. This indicates that the formation of a collaborative culture among teachers in ICT usage had already started.
Ownership of Computers and Internet Facilities at Home

The percentages of computer ownership at home for students from P6, S2, S4 and S6 are 51%, 72%, 82%, 91% respectively, and 87% and 91% for primary and secondary school teachers respectively. Among those who own computers at home, 37% of P6 students, 49% of S2 students, 58% of S4 students, 67% of S6 students, 63% of primary school teachers and 71% of secondary school teachers also had their computers connected to the Internet. On the other hand, the large difference in the percentage of students owning computers among schools is especially apparent at the primary level, with percentages ranging from 4.2% to 97% for P6 among the school.

![Boxplot Showing Mean Percentage of Students or Teachers Across Schools](image)

**Figure 2**
The percentage of teachers and students owning computers

ICT Competence and Source of ICT Knowledge

Percentages of students who indicated competence in basic computer operations ranged from 75%, 83%, 84% to 88% for P6, S2, S4 and S6 respectively. Students rarely use ICT as a problem-solving tool, with only 6.7%, 7.2%, 8.5% and 9.6% of P6, S2, S4 and S6 students respectively claiming experience in this aspect.

Results also revealed newspapers as a prominent source for acquiring new ICT knowledge for both students and teachers. As the grade level increases, the popularity of newspapers as a means for students to acquire ICT knowledge also increases, while that of television programs decreases. Most teachers did not report feeling uncomfortable when students' ICT skills surpass theirs.
Students said that they would seek help from friends and classmates when difficulty arose. The higher the grade level, the greater was the number of students seeking help from the Internet and media, and the less of them would ask teachers and parents for assistance. 6% of the P6, 11% of the S2, 17% of the S4 and 21% of the S6 students would resort to the Internet for help when encountering difficulties, and the rate of which was much higher than that of their teachers (only 5%), implicating that students have developed a stronger inclination and habit to acquire knowledge from the Internet.

Conclusion

The objective of this international comparative study is to provide a foundation upon which we can develop the vision and strategy to enhance development of effective ICT use in education in Hong Kong. This report is released almost one year after the data collection which took place between the end of 1998 and the beginning of 1999. Therefore, with fast developments both in Hong Kong and other countries, the situation in many of the aspects surveyed may have already been altered. The research team would like to highlight in this report that, although Hong Kong is a late-starter in terms of the establishment and implementation of its ICT policies, its direction and goal is similar to that found in many other countries which is to engender a pedagogical practice paradigm shift. At the same time, the study also discerns a positive attitude among principals and teachers towards ICT, and discovers that many attempts have been made in schools to experiment with the application of ICT in the emerging pedagogical practices. It nevertheless also exposes how ICT has widened the gap between schools. We hope that the shortcomings revealed in this research will catalyze educational development in accordance to the 21st Century Hong Kong Education Blueprint where the implementation and integration of ICT into education will nourish a new generation of progressive and life-long learners.


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