IT Trends in Four Years of Incoming Students at The University of Hong Kong

By **Anita Chi-kwan Lee**

Survey results show increased skill and comfort with computers, and changing attitudes about their use in education

Hong Kong's recent efforts to integrate information technology (IT) into education include the 1996 University Grants Committee (UGC) report on higher education and the five-year IT in Education Strategy announced by the government in 1998. At the same time, and alongside the implementation of other IT initiatives on campus, The University of Hong Kong started the first campus-wide notebook computer program in any Asian university. The Information Technology and Teaching Group (IT&T) in the Centre for the Advancement of University Teaching (CAUT) conducted "year-start" surveys (see the sidebar) to collect baseline information from new first-year students before they had any IT experience on campus.

This article provides an overview of Hong Kong's efforts to embrace IT in education, explaining secondary school student preparation for using IT before entering university, followed by a study of the year-start survey findings from 1998 to 2001. This survey analysis aims to identify trends in IT skills and attitudes among the four cohorts of incoming freshmen at the beginning of their first academic year at the university.[1]

Adoption of Information Technology in Education

In 1996, the UGC published a report on higher education in Hong Kong. The UGC is a non-statutory committee that advises the Hong Kong government on the funding needs of eight established local higher education institutions.[2] The report, *Higher Education in Hong Kong*, advocates embracing information technology in education. "We believe that the expected educational quality benefits demand the adoption of information technology — to maintain or increase competitiveness if for no other reason."[3] This was one of the few initiatives that confirmed the importance of IT in the future of education. Even before the report was published, Research Grants Committee (RGC) and UGC funding had set aside more than HK$300 million in the

1995–1998 triennium to support the development of IT-based teaching development projects, IT-related research projects, and the Hong Kong Academic and Research Network (HARNET).[4]

A year later, Chief Executive Tung Chee Hwa pledged in his inaugural policy address that Hong Kong would be a leader in the future information world. The IT in Education Strategy[5] document laid out objectives to equip young people with the skills and attitudes required in the information age, and initiatives that would help realize these objectives at the pre-university level. The proposed initiatives included investing in the infrastructure for Internet access for students and teachers; providing IT facilities for use in schools; integrating IT into the curriculum, providing IT training for teachers; and developing students' learning targets at different stages. The document also called for support to foster a community-wide culture change.

Student Access to Computers and the Internet

Student computer ownership necessarily points to the issue of access equity. As the use of IT in the learning process becomes commonplace, students who do not own computers will be at a disadvantage in their studies. Since the drawing up of the IT Strategy, student access to computers and the Internet has improved significantly, both at home and in schools. The Second International Information Technology in Education Study (SITES) reported home ownership of computers in 1999 for Secondary 6 (S6) students in Hong Kong to be 91 percent; among them, 67 percent had Internet access.[6] (S6 and S7 courses prepare students for tertiary education, and institutional selection of students is mainly based on the results obtained from an exit examination.) The study also found that the student-to-computer ratio in secondary schools in 1999 was 36 to 1, and over 80 percent of secondary schools had access to the Internet for teaching and learning purposes. Even though the level of computer provision was not high compared to countries like Canada, New Zealand, Singapore, and Norway, which have student-to-computer ratios of 18 to 1 or even fewer, Hong Kong secondary schools have high-quality peripherals like LCD panels and video projectors.

On the territory-wide level, figures from the Census and Statistics Department (C&S) showed that in 2001, 61 percent of all households in Hong Kong had personal computers, and 49 percent had Internet access.[7] The 2001 C&S data also indicated that slightly more than half of all persons in Hong Kong aged 10 and over had used personal computers, and 43 percent had used the Internet, during the 12 months prior to the survey.[8] These data, and those of the SITES project, suggest that computer and Internet access are recognized as priorities for students, especially those in upper grades, to facilitate learning. The SITES study also indicated significant correlation among "all areas of self-proclaimed competence with home computer ownership."[9]

In addition, the socio-economic background of the students affects their access to IT for learning. The issue of access equity was most acute for students in the lower grades. The situation could become more serious as IT applications are more highly integrated into the curriculum.

Student Preparation for IT Readiness

While 88 percent of S6 students reported competence in basic computer operations,[10] the SITES study also found

Notes on Methodology

While the year-start survey conducted on the 1998 cohort was a census/non-sample survey, the other three were random-sample surveys. The number of students (*n*) involved and the response rates for the different year-start surveys in the four years follow: 1998: *n*=828, 30.1 percent; 1999: *n*=444, 63.4 percent; 2000: *n*=617, 50.8 percent; 2000: *n*=441, 63.0 percent. In the 2000 year-start survey, a quota was introduced to the sampling process of both the participants and non-participants in the notebook computer program. At a 95 percent confidence level, the margin of error for both the 1999 and 2001 year-start surveys was within ±4.3 percent, while that for the 2000 year-start survey was within ±3.5 percent. More details on the individual surveys can be found at <http://www.hku.hk/caut/Homepage/itt/5_Reports/5_3surveys.htm>.

Both the 1999 and 2000 year-start surveys indicated a difference between the male and female ratios of the actual population of first-year students and that of the survey respondents. Since the differences were bigger than the respective margins of error for the surveys, the results of the 1999 and 2000 year-start surveys were weighted according to the actual gender distribution of the respective populations of freshmen. For both surveys, a weight factor was calculated for the responses from each of the groups of male and female students by dividing the individual male and female percentages of the actual population by those of the survey sample.

To investigate the extent of changes over the four years, the differences between the findings of the first (1998) and the fourth (2001) year-start surveys were compared, with the margin of error at the 0.05 level of the findings of the 2001 survey. If the differences exceeded the margin of error, then the changes were significant at the 0.05 level. The maximum margin of error for a proportion of 50 percent was calculated to be ±4.3 percent. For proportions bigger or smaller than 50 percent, the margin of error will be smaller.

that the application of IT in teaching and learning remained at a very primitive stage. Only 10 percent of the secondary school teachers surveyed had taught non-computer subjects in the computer room, and 11 percent had used computers outside of the computer room for teaching and learning.[11] Similarly low percentages of students had used computers for learning activities in non-computer subjects. Game-playing was the most popular use of computers for students at all levels. Even though the percentages of S6 students using computers to search for data and do homework reached 60 to 80 percent, there was a great variation across schools in student computer usage for learning and communication.[12] This possibly results from the significant effect of the school curriculum on students' computer usage patterns.

According to the SITES researchers, schools also displayed a large disparity in the pedagogical paradigm of IT integration. The authors of the study recommended that schools develop clear IT policies and explicit implementation plans, not only to encourage the desired paradigm shift but also to encourage parents to procure computers for students to use at home. Embracing of IT by school leadership would also influence teachers' attitudes and their practices of applying IT in their classrooms. The study suggested that schools should offer teachers professional development programs pedagogically oriented to IT so that teaching and learning activities would be organized to employ IT to bring about the desired learning outcomes for students. These efforts, the study said, should be carried out hand-in-hand with major curriculum reforms that would consider IT integration as a priority.

The Case of The University of Hong Kong

At The University of Hong Kong, five years have passed since the Ad Hoc Group for Learning Technologies made their recommendations in the Final Report in June 1997. Accomplishments have been made at the university to create both a "digital campus" with ubiquitous and simple access to computers and network resources, as well as a "digital culture" in campus life with the integration of information technologies into teaching, learning, and research.

There was a great variation across schools in student computer usage for learning and communication.

IT Initiatives on Campus

One IT initiative implemented since 1998 is a student IT requirement for graduation. Students may opt to take a central IT course, "Foundations to Information Technology," in six modules and receive three course credits, or pass an IT Proficiency Test to meet the requirement without any credit. Individual departments have also developed and prescribed discipline-specific courses as meeting the IT requirement.[13]

In 1998, the university implemented a campus-wide notebook computer program to ensure that each student has 24-hour access to a high-quality notebook computer for education and research. Under the program, all incoming first-year undergraduate students have the opportunity to purchase one of several models of IBM ThinkPad computers at a discounted rate, with a subsidy from the university. The participation rate in the notebook program averages 80 percent for the four cohorts of year-one students.[14]

The university has put other IT initiatives into effect in the areas of policy, infrastructure, curriculum, and support. These include

- the ACITE, an academic advisory council, to serve as a think-tank on IT in teaching, learning, and scholarship, and an IT Secretariat in support of the Council's work;
- an "IT review" by an outside expert to help formulate future IT policies;
- a plug-and-play network, ACEnet, with over 10,000 access points across campus;
- wireless LAN access, with installation throughout the campus to be complete within the next few years;
- Teaching Development Grants to fund projects of new ideas and approaches of IT integration in teaching and learning;
- IT-based programs and projects integrated into the curriculum of individual disciplines, including "CIVCAL" of the Department of Engineering, the "Geohazards" course of the Department of Earth Sciences, the "Virtual English Centre" of the English Centre, the "Virtual School of Biodiversity" of the Department of Ecology and Biodiversity, and the "Virtual Studio" of the Faculty of Architecture;
- the Centre for Information Technology in School and Teacher Education (CITE) in the Faculty of Education;
- the E-Business Technology Institute (ETI) jointly established with IBM/Hong Kong Limited;
- WebCT licensed as a standard Web-based teaching platform for delivery of information and instruction;
- the "IT Fiesta" in 2000 and the "IT in Education" awards program from 2001 on, activities organized by ACITE to focus attention on IT use on campus;
- the Information Technology Student Ambassadors (ITSA), initiated by the Student Computer Society, to provide IT-related assistance to staff and students;

- the IBM Service Centre on campus to support users of ThinkPad computers procured through the notebook program;
- an online student information and registration system, Student Connect; and
- the Electronic Services Delivery (ESD) system, which has created and issued HKU digital certificates (HKU-Cert) using public key infrastructure (PKI) to staff and students, with the aim of eventually achieving a paperless campus.

All these initiatives are efforts to create a technology-enriched learning environment on campus that will foster integration of IT into teaching, learning, and research.

Freshmen Home Computer Ownership and Internet Access

With the infrastructure and IT initiatives in place, how ready were our freshmen to immerse themselves in this learning environment? The year-start surveys provided a chance to profile incoming students, to gauge the level of computer ownership to determine their readiness for learning through IT, and to trace the trends in their skills and attitudes before they received a university education.

Beginning in August of 1998, as part of its support of the notebook computer program, the IT&T Group surveyed each incoming class at the beginning and end of their first year at the university.[15] Students were asked to assess their level of competency using computers and their familiarity with specific software packages. Students then responded to a series of statements concerning their attitudes toward the use of computers in education.

As mentioned, student computer ownership has a strong influence on access equity and thus on learning opportunities increasingly offered through the use of IT. Each cohort of incoming freshmen was asked whether they or their family owned a computer before entering university. Comparing the responses from the 2001 cohort with those of the 1998 cohort shows a significant increase — 7 percentage points — in the proportion of respondents who answered yes (see Table 1). In the 2001 cohort, more than 99 percent of the respondents owned a computer. This finding tallies with the SITES study, which found that 91 percent of S6 students in 1999 had a computer at home. In addition, 92 percent of the 2001 first-year respondents said they had Internet connections at home, a significant increase from the proportion of S6 students who had Internet access in 1999 (61 percent).

After two years of matriculation courses, some of the S6 students were admitted to the university to become the 2001 cohort of freshmen at the university. All of this group owned a computer, and very few did not have an Internet connection at home. In terms of access both to computers and the Internet, the 2001 cohort was very well prepared for integration of IT in their university education.

Advancement in IT Skills

The IT skills of incoming freshmen improved significantly over the four years of the study. At the beginning of each academic year, incoming freshmen were asked to rate themselves in terms of their "current ability to use a computer" from a list of five choices: expert, significant experience, intermediate experience, limited experience, or beginner. A brief description was offered of the types of skills relevant to each choice.[16] Table 2 compares the findings of self-reported computer competency among the four groups studied.

Because nearly all the students had a computer at home and had used it for learning purposes before their university education, it is not surprising to find that the percentage of those possessing more advanced computer skills has increased significantly over the years. There were practically no self-rated beginners in the 2001 cohort, compared to nearly 9 percent in the 1998 cohort. While the proportion of those labeling themselves as having limited experience decreased by 16 percentage points from 1998 to 2001, the percentages of those with significant experience and intermediate experience in the same period increased more than 10 percentage points each. Even the category of expert saw a significant increase of 3 percentage points. The highest proportion of experts — nearly 7 percent — was reported by the 2000 cohort.

Table 1

Computer Ownership

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Yes	92.0%	96.6%	99.0%	99.3%	7.3%*
No	8.0%	3.4%	1.0%	0.7%	-7.3%*

* Statistically significant at the 0.05 level

Table 2

Self-reported Computer Competency

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Expert	1.9%	4.8%	6.5%	5.2%	3.3%*
Significant Experience	15.3%	20.9%	27.9%	26.3%	11.0%*
Intermediate Experience	31.1%	38.1%	38.9%	40.8%	9.7%*
Limited Experience	43.1%	33.2%	23.7%	27.2%	-15.9%*
Beginner	8.5%	3.1%	3.0%	0.5%	-8.0%*

* Statistically significant at the 0.05 level

The number of software packages that respondents knew is another measure assessing the IT skills of the group. Figure 1 illustrates the changes in the number of software packages known by the four cohorts of respondents. The mean number of software packages known by the 2001 cohort was 10.93, a significant increase from the 1998 cohort's mean of 7.21, even though the highest mean was recorded, again, by the 2000 cohort — 11.70.

Respondents were asked whether they had taught someone to use computers. More than half of the respondents from the 2001 cohort had such experience, an increase of nearly 10 percentage points over the 1998 cohort. However, the largest proportion of those having taught others to use computers was found in the 2000 cohort, reported to be nearly 57 percent (see Table 3). Together with the results of the previous questions, one can infer that the 2000 cohort had the best IT skills among the four groups.

As larger proportions of freshmen acquired more advanced computer skills and were able to teach others to use computers, it follows that they had more confidence in using computers. Two statements concerning IT attitudes relate to this aspect: "I feel comfortable using computers," and "I am fearful about computer use." Tables 4 and 5 show the results for these two statements in the four year-start surveys.

Comparing the responses from the four cohorts, respondents' confidence in using computers increased significantly year by year. Nearly three quarters of the respondents from the 2001 cohort agreed that they felt comfortable using computers. This was an increase of 10 percentage points from the nearly two-thirds in the 1998 cohort. The proportions of respondents who disagreed and who were undecided each decreased by 5 percentage points from 1998 to 2001 (see Table 4).

Those who disagreed with the statement "I am fearful about computer use" accounted for a similar change (from 67 percent to 75 percent) between 1998 and 2001. There was also a decline of 5 percentage points

Figure 1

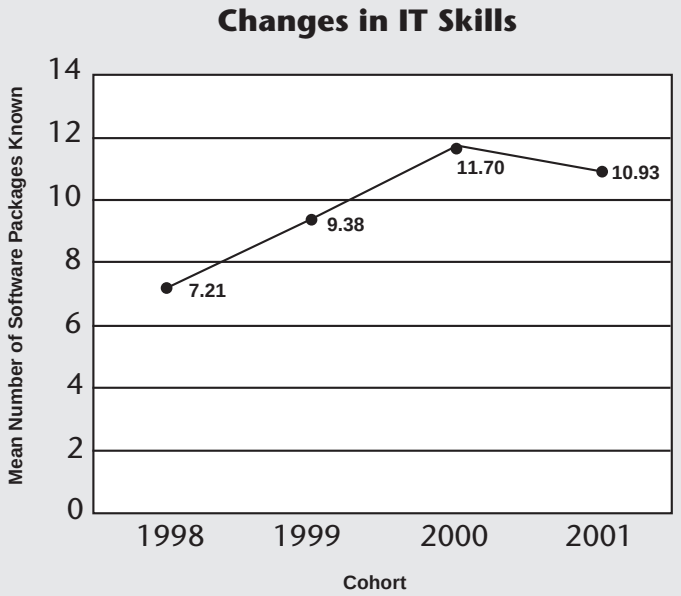

Table 3

Experience Teaching Others to Use Computers

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Yes	41.8%	56.0%	56.7%	51.3%	9.5%*
No	58.2%	44.0%	43.3%	48.7%	–9.5%*

* Statistically significant at the 0.05 level

Table 4

"I feel comfortable using computers."

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Agree	63.3%	69.7%	73.6%	73.5%	10.2%*
Disagree	15.8%	11.1%	13.3%	10.9%	–4.9%*
Undecided	20.9%	19.2%	13.1%	15.6%	–5.3%*

* Statistically significant at the 0.05 level

Table 5

"I am fearful about computer use."

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Agree	18.1%	15.2%	13.7%	15.0%	–3.1%*
Disagree	66.8%	71.2%	70.4%	74.8%	8.0%*
Undecided	15.2%	13.5%	15.8%	10.2%	–5.0%*

* Statistically significant at the 0.05 level

from 1998 to 2001 in the proportion of respondents who expressed indecision over the statement (see Table 5). The study clearly showed that incoming freshmen became increasingly confident in using computers over the four years studied.

Changes in IT Attitudes

In each of the surveys, students were presented with a list of statements concerning their attitudes toward general and educational computer use. They were asked whether they agreed or disagreed or were undecided about each of the statements. The list of statements can be found on the IT&T Surveys and Reports Web site <http://www.hku.hk/caut/Homepage/itt/5_Reports/5_3surveys.htm>.

Computer Use in Education. Although access to computers has become increasingly ubiquitous — as reflected by the growth in the number of students who reported family or personal computer ownership — larger proportions of respondents have become doubtful about the effectiveness of computer use in their studies. The 2001 cohort indicated nearly unanimous support for the importance of traditional pedagogical practices, in the form of lectures and class discussions. Even as computer use has become commonplace in the learning environment, students have come to believe that computers are helpful only as tools in the learning process. Students communicated increased skepticism that use of computers alone could make learning easier and more efficient.

Compared to four years ago, 2001 saw an increase of 8 percentage points in the proportion of respondents who agreed with the statement "Computers do not replace the need for lectures and discussions in class." In addition, those who were undecided increased by 7 percentage points (see Table 6).

Moreover, 70 percent of the 2001 cohort agreed with the statement "Computers will make learning easier and more efficient." This was a decline of nearly 7 percentage points from the 1998 supporters. The proportion of those who expressed indecision in the 2001 survey increased by 4 percentage points (see Table 7). It is also interesting to note that although the 2000 cohort had the strongest computer skills, they had the smallest percentage who agreed that computers would make learning easier and more efficient. Clearly, students viewed computers as instruments for learning and believed that the attainment of desired learning outcomes did not depend solely on mastery of computer skills.

Three other statements that imply a positive attitude toward the use of computers consistently received support from a majority of survey respondents,[17] further reinforcing the notion that computer use was viewed as helping to attain more advanced educational goals.

Common Myths of New Technologies. The ubiquity of computers seems to have gradually dispelled the mystery surrounding technology and the halo effect of its application in education. In the surveys, support for the statement "Use of computers could make the academic climate at HKU more intellectually exciting" dropped a significant 21 percentage points from the 1998 survey to the 2001 survey (see Table 8). At the same time, there was an increase of 10 percentage points in the 2001 cohort who disagreed with the statement.

Meanwhile, respondents have become less skeptical about the negative effects of computer use on human interactions.

Table 6

"Computers do not replace the need for lectures and discussions in class."

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Agree	82.0%	86.3%	89.1%	90.2%	8.2%*
Disagree	5.0%	5.7%	3.7%	3.4%	–1.6%*
Undecided	13.0%	8.0%	7.2%	6.3%	–6.7%*

* Statistically significant at the 0.05 level

Table 7

"Computers will make learning easier and more efficient."

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Agree	76.8%	72.9%	67.5%	70.3%	–6.5%*
Disagree	5.7%	6.1%	11.7%	8.2%	2.5%*
Undecided	17.5%	21.1%	20.7%	21.5%	4.0%*

* Statistically significant at the 0.05 level

Table 8

"Use of computers could make the academic climate at HKU more intellectually exciting."

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Agree	59.9%	48.5%	40.0%	38.5%	–21.4%*
Disagree	11.5%	17.3%	26.0%	21.1%	9.6%*
Undecided	28.7%	34.2%	34.0%	40.4%	11.7%*

* Statistically significant at the 0.05 level

In 2001, 65 percent of respondents disagreed with the statement "I fear that computers could negatively affect the way I interact with people" — an increase of 10 percentage points over 1998 (see Table 9). The stereotypical image of a nerd typing away on a computer without any face-to-face interaction with other people no longer haunts our freshmen, who had generally positive attitudes about the effect of computer use on interpersonal relationships.

A consensus was not reached, even after four years, on whether the learning process would be rendered impersonal through the use of computers. Opinion has remained largely split regarding the statement "Use of computers in teaching made the learning process impersonal." There was an increase of 7 percentage points in the proportion of respondents who agreed in 2001, reaching more than one third. Another third was undecided, after a decline of 8 percentage points from 1998 (see Table 10). It will be interesting to see if entering students in the coming years gradually agree on this issue.

Staff Development and Support

If student preparation for use of IT is instrumental to the effective integration of IT in university education, then staff development and support should be given equal, if not more, weight. Despite the Ad Hoc Group's recommendation to devote new resources to staff development, technical support, and curriculum development, cuts in government funding have forced the university to bring focus on more efficient and economical staff development efforts. Another recommendation of the IT and Teaching Task Force — to give notebook computers to select staff to encourage the development of relevant curricula — also was not implemented.[18]

Innovative educational programs have, nevertheless, been developed for classroom use. These changes in teaching practices have resulted from the efforts of individual teaching staff. Lecture and tutorial sessions, supplemented by the newly developed IT-based learning initiatives, still primarily deliver the core curriculum. To address the issue of staff development and to further enhance IT integration into the curriculum, the university is implementing CAUT's proposal[19] of distributed staff development, allowing for distributed support for academic staff who use IT. Other recommendations are being considered in the university's current strategic planning efforts.[20]

As for IT support services, the findings of the Faculty IT Support Survey in 1998 revealed that these services were offered then on a very basic level, and different faculties and departments usually employed a problem-based treatment to ad-hoc issues.[21] The study called for central coordination of planning efforts, which is still one of the focal points of proposed IT strategies recently discussed on campus.

Conclusion

In each year of the study, HKU's incoming students have reported higher levels of computer skills than students of previous years. The respondents' level of confidence in using computers has improved greatly, and more students have already had some IT training before starting their university education. Increasing ownership of personal computers and the changes brought about by the government initiatives are two possible explanations for this trend.

Despite higher levels of computer skills among incoming freshmen, however, they were more inclined to view computers only as a tool to achieve more advanced educational goals. Rather than an end to the educational processes, computer use is seen as a means.

Hong Kong is a late starter in drawing up a master plan for incorporating IT in education compared to countries like Japan and the United States. Even though the IT in Education Strategy called for a community-wide culture change and introduced initiatives to create a technology-enriched learning environment in schools, the desired paradigm shift has not occurred. It remains to be seen whether the proposed curriculum reform will have any significant effect on full integration of IT in primary and secondary school education.

Table 9

"I fear that computers could negatively affect the way I interact with people."

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Agree	20.3%	19.1%	17.6%	16.1%	–4.2%*
Disagree	55.3%	57.9%	61.5%	64.9%	9.6%*
Undecided	24.4%	23.0%	21.0%	19.0%	–5.4%*

* Statistically significant at the 0.05 level

Table 10

"Use of computers in teaching made the learning process impersonal."

	1998 Cohort	1999 Cohort	2000 Cohort	2001 Cohort	Difference (2001–1998)
Agree	33.7%	34.7%	34.4%	40.2%	6.5%*
Disagree	25.4%	24.1%	28.9%	26.5%	2.4%
Undecided	41.0%	41.3%	36.7%	33.3%	–7.7%*

* Statistically significant at the 0.05 level

Rather than an end to the educational processes, computer use is seen as a means.

A review of IT integration at The University of Hong Kong has exposed a situation that mirrors the current territory-wide condition. Many resources were dedicated to the development of the infrastructure, networking, and computing facilities needed, but fully IT-based programs have only been offered in individual classrooms because of a lack of related staff development and support programs. Overall, IT planning and management have yet to take the place of current practices, which are of an individual and ad-hoc nature.

As HKU approaches the fifth year of implementing the notebook computer program, the university must review the social and technological changes that have influenced our incoming students' computer skills and their attitudes toward the use of IT in education. It is also time to seriously consider measures to encourage and support staff in their IT efforts, possibly by establishing university policies and guidelines for formal recognition and reward. In the coming year, a full review of the notebook program, as well as the creation of a new strategic plan for IT development, should take these issues into account. *e*

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Endnotes

1. This article does not try to differentiate between participants and non-participants in the notebook computer program in the differences on their self-reported IT skills and attitudes.
2. The eight higher education institutions under the auspices of UGC are The Chinese University of Hong Kong, City University of Hong Kong, Hong Kong Baptist University, Hong Kong Institute of Education, The Hong Kong Polytechnic University, The Hong Kong University of Science and Technology, Lingnan University, and The University of Hong Kong.
3. University Grants Committee, *Higher Education in Hong Kong — A Report by the University Grants Committee* (Hong Kong, October 1996), <http://www.ugc.edu.hk/HERVW/CONTENT.html>.
4. Disclosed by Edgar W. K. Cheng in his opening address at the Fourth Hong Kong Web Symposium on April 9, 1998, <http://www.ugc.edu.hk/english/documents/speeches/sp_web98.html>.
5. Education and Manpower Bureau, HKSAR, *Information Technology for Learning in a New Era — Five-Year Strategy 1998/99 to 2002/03* (Hong Kong: Education and Manpower Bureau, HKSAR, November 1998), <http://www.info.gov.hk/emb/eng/archive/consult/it/toc.html>.
6. N. Law et al., *The Second International Information Technology in Education Study — Hong Kong SAR Report*, SITES Hong Kong Study Centre, Centre for Information Technology in School and Teacher Education, The University of Hong Kong (Hong Kong, 1999), pp. 97–99.
7. Census and Statistics Department, HKSAR, *Hong Kong in Figures — Penetration of Information Technology in the Household Sector*, <http://www.info.gov.hk/censtatd/eng/hkstat/hkinf/it/it_1_index.html>.
8. Census and Statistics Department, HKSAR, *Hong Kong in Figures — Usage of Information Technology Amongst Household Members,* <http://www.info.gov.hk/censtatd/eng/hkstat/hkinf/it/it_2_index.html>.
9. Law et al., op. cit., p. 105.
10. Ibid., p. 106.
11. Ibid., p. 50.
12. Ibid., p. 107.
13. Details about IT requirements for individual curricula can be found in the university annual publication *Undergraduate Degree Regulations and Course Descriptions*, <http://www.hku.hk/afss/archives/>.
14. Participation rates in different years were 87 percent in 1998, 79 percent for 1999 and 2000, and 75 percent for 2001. This decline can possibly be attributed to universal ownership of home computers in the populations of incoming freshmen, gradually achieved over the four years.
15. Look under Surveys and Reports, IT&T, Centre for the Advancement of University Teaching, The University of Hong Kong, <http://www.hku.hk/caut/Homepage/itt/5_Reports/5_3surveys.htm>.
16. Ibid.
17. The three statements are "Use of computers will facilitate searching for information" (97 percent in 1999, 96 percent in 2000 and 98 percent in 2001), "I expect the use of e-mail will give me easier access to instructors and students" (84 percent in 1998, 81 percent in 1999, 85 percent in 2000, and 83 percent in 2001), and "I would benefit from classes which teach me computer use" (82 percent in 1998, 79 percent in 1999, 76 percent in 2000, and 80 percent in 2001).
18. C. Blurton, A. Lee, and W. Ng, "The University of Hong Kong's Notebook Computer Programme: A Glass Half-filled," in *More Community Through Computers: 20 Ubiquitous Computing Programs*, D. Brown, ed. (Bolton, MA: Anker Publishing Company, Inc., in press).
19. Centre for the Advancement of University Teaching, The University of Hong Kong, "The Learning Network — Proposal for Development of the Centre for the Advancement of University Teaching at the University of Hong Kong," <http://www.hku.hk/caut/tln/paged.htm>.
20. C. Blurton, "Vital Changes: Technology and Transformation at The University of Hong Kong," in *Proceedings of the 3rd International Conference on Information Communication Technologies in Education*, K. Fernstrom, ed., National and Kapodistrian University of Athens (Athens, Greece: National and Kapodistrian University of Athens, 2002), pp. 120–1.
21. See Surveys and Reports, IT&T, Centre for the Advancement of University Teaching, The University of Hong Kong, <http://www.hku.hk/caut/Homepage/itt/5_Reports/5_3surveys.htm>.

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