

THE HONG KONG INSTITUTE OF EDUCATION

**RESPONSE TO: “INFORMATION TECHNOLOGY IN EDUCATION:
WAY FORWARD”**

13 May 2004

Reflections on the 5-year Strategy

The publication of “Information Technology in Education: Way Forward” (Education and Manpower Bureau, 2004) provides an opportune time to reflect on the past five years and the aim to “transform school education from a largely teacher-centred approach to a more interactive and learner-centred approach” (Foreword). The report reaffirms the vision that the effective use of IT can improve learning outcomes for students. This document allows educators to reflect on the thoughtfulness, creativity and design of the ways we are using IT in education and the need to consider a future direction. The report acknowledges the significant challenges and barriers to realising the goals of the original five-year strategy.

Access & Connectivity

While a formal evaluation of the strategy is still underway, it is evident that Hong Kong schools have achieved a sound level of access and connectivity. Significant progress has been made in establishing the infrastructure (network, hardware, etc) in this area. The increased availability of computers and broadband connections for primary and secondary schools is a significant achievement. This development of the necessary environment enables IT to be used as a lever for further pedagogical change focussed on a “learner-centred approach”. The Hong Kong Institute of Education (HKIEd) supports this vision but also encourages a greater emphasis on the development of *evidence-based approaches* at the learner, teacher, administrator, classroom, school and community levels to “test” this vision.

Teacher Enablement

While most Hong Kong teachers have achieved basic IT skills (77%), we need to be cautious in interpreting an increased skill level in IT as a corresponding increase in ability to enable a ‘paradigm shift’ from a “teacher-centred approach to more interactive and learner-centred approaches”. Only 6% of teachers have reached the “creative” level which would foster this paradigm shift. The HKIEd applauds this level of skill development as an initial step but suggests that this direction alone will not achieve the vision of a learner-centred approach. HKIEd encourages EMB to shift its focus from widespread skill upgrading and concentrate on significantly increasing the number of teachers who work at the “creative” level. This may require different approaches to professional development of teachers, that should focus on strategies such as project-based learning and action-learning initiatives. In other words, teachers need exposure to innovative approaches involving collaboration with other teachers over a sustained period of time. Only by participating in an immersive program over a period of time as opposed to short skill courses will teachers begin to work at the creative level and encourage their students to also achieve the creative level.

Digital Resources

It is suggested that a “rich repository of digital education resources” (p. 1) have been collected. However we have to be cautious about confusing quantity with quality, as these resources may continue to perpetuate teacher-centred approaches rather than supporting learner-centred approaches. We would stress to EMB that the educational value of the digital education resources needs to be determined through a comprehensive evaluation. In addition, each time a resource is completed an evaluation report should be included before it is uploaded to the portal. Although many resources are available, we should determine whether they assist the vision toward a learner-centred approach. There is no mention about the quality of resources, simply that “a remarkable volume of curriculum resources and materials” (p. 2) have been produced. A mechanism for assuring quality resources to support learner-centred approaches needs to be developed and systematised in order to assure life-long and life-wide learning for our students.

Case studies on pedagogical approaches

There are many questions that remain to be answered regarding the effectiveness of the previous strategy. While IT is clearly promoted as a “lever” for change, the extent to which the use of IT in Hong Kong schools has transformed educational practice, resulting in a shift from teacher-directed to student-centered teaching and learning, is yet to be determined (Pearson, 2001). The Second Information Technology in Education Study Module 2 (SITES M2 – <http://www.sitesm2.org>) does provide examples of innovative uses of technology (both in Hong Kong and internationally) but on a global scale the overall numbers of teachers adopting these approaches is still small (Kozma, 2003). The imperative for IT integration across the curriculum based on constructivist approaches is still strong in the document and HKIEd fully supports this approach. There is evidence pointing to the benefits of adopting constructivist-type approaches to the integration of information technology into teaching and learning (Jonassen, Peck & Wilson, 1999, Laurillard, 2002; Roblyer & Edwards, 2002). Educators may acknowledge constructivism as an ideal but it is rarely achieved in practice (Windschitl, 1999). The majority of teachers today continue to practice a “knowledge telling” model of teaching and learning.

Barriers

The report recognises a number of barriers affecting the use of IT in teaching and learning. In particular the HKIEd suggests a closer focus and priority on the crucial role that school leaders have in the process. To reiterate, “the success of applying IT in education lies mainly with the support of school heads as visionary leaders and agents for change” (p. 3). As suggested, “appropriate professional development” is lacking. Leaders need to be involved in developments that encourage mentoring relationships and action-learning.

A second area of priority focuses on teachers. Basic training in IT skills are insufficient in moving to a learner-centred approach. It is recognised that “some training courses provided have been skewed towards training in IT skills, not the application of IT to enhance learning and teaching” (p. 5). This also explains the inability of some teachers to adopt digital learning resources that have “significant cognitive and pedagogical research” embedded into the cognitive tool.

VISION FOR THE FUTURE

Goal 1: Empowering learners with IT – Students will acquire the necessary skills, knowledge and attitudes for lifelong learning and creative problem solving in the information age. They will use IT as an information retrieval, knowledge enquiry, communication, collaboration, analytical and personal development tool.

Information literacy

It is suggested that a broad framework of ‘information literacy’ for students will be developed and the HKIEd suggests that this should be considered as a top priority. We would expand the general framework documented on page 11 and 12. We feel that ‘information literacy’ involves:

- Location and access: locating sources and finding information within sources
- Use of information: Engaging with information (e.g. read, hear, view) and extracting relevant information
- Evaluation: judging the result (effectiveness) and the process (efficiency) of using the information

- Synthesis: Organising information from multiple sources, transforming and presenting information

Students as designers

Creative problem-solving should begin with authentic cases, individual problems to solve, as well as group problems to solve that require collaboration and project-based learning approaches. Online learning should be used to emphasise dialogue between students and between students and teachers. The main shift in practice will be from teaching about IT to engaging students in open-ended and collaborative IT activities that require them to become “designers”. It is important to remind ourselves that students are immersed in technologically rich environments outside of school and they use media, television, movies, mobile phones, computers, internet chat rooms, BLOGs and computer games with ease and confidence. A focus on “design” offers a viable way of connecting with young people’s interests and needs. There is recent empirical evidence that shows students find the use of IT for learning to be highly motivating (Passey, Rogers, Machell & McHugh, 2004). The authors claim:

"Positive motivational outcomes were most frequently found when ICT was used to support engagement, research, writing and editing, and presentation of work. Where ICT uses supported internal cognitive aspects of learning, for example in the case of secondary design and technology, there were indicators that the motivation arising from the use of ICT was linked to enhancements in some subject specific attainment. More positive motivation resulted when ICT use was focused on both teaching and learning, than when ICT was used to support teaching alone”.

Assessment

Changing the assessment to learning-oriented and formative evaluation will also encourage a learner-centred approach. The learning of students is driven by the assessments that they undertake and the development of new forms of assessment will assist in reshaping the curriculum. New thinking in teaching, learning and assessment shows that the potential learning gains of well-focused formative assessment are highly significant and an important aspect of the current educational reform agenda (Carless, 2003). Brown, Race & Rust (1995) suggest that “the key to the use of assessment as an engine for learning is to allow the formative function to be pre-eminent. This is achieved by ensuring that each assignment contains plenty of opportunities for learners to receive detailed, positive and timely feedback with lots of advice on how to improve” (p.81). Whether teachers are IT capable or not, they need to use the technology to add fresh approaches to their instruction. Teachers need to see that the use of innovative ICT or online tools opens doors for students to experience different assessment methods, and these methods must be accepted and adopted by teachers and administrators alike.

Goal 2: Empowering Teachers with IT – Teachers will be provided with professional development opportunities and support to undertake the challenge of using IT for curriculum and pedagogical innovations, and to facilitate, guide, administer and assess learning in ways that align with the goals of the curriculum reform. Support structures and mechanisms will be developed to foster the development of online and off-line communities of practice for teachers for exchanging experience and good practices as well as collaborative problem solving.

Teacher competencies

The range of teacher competencies outlined in the document needs to be extended. Teachers should have the following competencies in IT:

1. Positive attitude towards IT in general
2. Ability to understand the educational potential of IT
3. Ability to use IT effectively in subject teaching
4. Ability to evaluate IT resources from an educational viewpoint
5. Technical capability to use an appropriate range of IT resources, and to update skills as required

Integrating ICT

Teachers need to begin by transforming their approach to teaching and learning, and then make a decision about the type of technology that will support this new approach. This is an emphasis on integrating information and communication technology (ICT) into education, not using information technology (IT) for its own sake. In recent times the nomenclature and acronym of Information Technology (IT) has been superseded in the literature and use in policy documents by the phrase Information and Communication Technologies (ICT). This highlights the transformative nature of the range of new technologies that have become available, as well as indicating the effect that such new technologies have had on communications. It is recommended that the term IT be replaced with ICT in this important document in order to align the plans and development of the use of new technologies in the Hong Kong SAR with those on the global scale.

Professional development

It is suggested that “new models of professional development should be developed” (p. 14). From our experience at HKIEd, we have found that one of the continuing challenges to effectively integrating ICT involves moving away from narrow and technical views of IT-based teaching and learning. Technical approaches can be characterised by an emphasis on developing skills and the teaching of specific software applications. There is also evidence that technical approaches often increase a teacher’s reluctance to adopt new technologies (Becker, 2000; Downes, 2002). Shifting away from technical views encourages approaches that emphasise applications that support higher level thinking and meta-cognitive guidance, such as those often referred to as Type II applications (Maddux & Cummings, 1986; Maddux, Johnson & Willis, 2001). In order to do this we need to develop a broader understanding of ICT and encourage schools to engage in a sustained dialogue where ICT is no longer seen as a technical issue but rather a *whole school challenge* (Lee, 2002b) that is focused on improving learning outcomes for all students.

Recent research evidence (see e.g. Lee, 2002a) suggests that priorities must focus simultaneously on the development of teacher technical competence and on dealing with the educational issues of designing lessons. Sufficient time and effort have to be expended in developing in teachers a critical understanding of the technology as a shaper of information

and values. Lee (2002a), when working with a group of teachers on designing individualised lesson plans for online and classroom delivery using an integrated online learning environment, had highlighted that teachers were well aware that the integration of ICT had rich potential for enabling more effective learning, but this could only be achieved if at every stage of change the technology is subordinated to the learning goals of the school. This study has also emphasised the fact that teachers should not be afraid to admit to deficiencies in their current classroom pedagogy. They need to be ready to concede that different ways of learning may be more appropriate when using ICT tools and should be given the freedom to adapt curriculum topics to suit the individual learning needs of students. Future professional development programmes must aim to assist school panels and coordinators to fully support this kind of change. Teachers need to place great emphasis on meaningful, engaged learning with technology, in which students are actively involved in the learning process. Students need to take ownership of their learning, act as explorers and producers; teachers function as facilitators and guides. Used effectively, technology can encourage collaborative learning, development of critical thinking skills, and problem solving. Above all teachers need to be constantly trying out new teaching styles even if they are unfamiliar and cause discomfort.

Instructional software

The “development of more instructional software and indexing resources for ease of retrieval and use” (p. 16) may not be enough if these resources perpetuate teacher-centred approaches. We are concerned that there appears to be an emphasis on the development of software which is highly “instructionist” in approach, which may not facilitate student-centred learning approaches. We would strongly recommend that a critical audit is conducted to examine these digital resources.

Goal 3: Enhancing the Leadership Capacity of Schools for the Knowledge Age – School heads and their associates will be guided and supported to establish visions and goals as well as build teams appropriate for their school contexts, in order to enable them to effectively lead change in integrating technology into school planning, curricula, learning and teaching processes, communication and collaboration. They will be given more flexibility in making decisions that tailor to the needs of their schools.

Policy and Strategy

The HKIEd applauds the emphasis in the document on enhancing the leadership capacity of school heads. These change agents are crucial to the success of all initiatives within the school setting and the utilization of “IT is a lever for innovation” (p. 17). Emphasis on providing professional development for heads in the areas of policy and strategy should assist the adoption of appropriate methods to implement the strategy. Continuing professional development is also essential on a long-term basis.

Supporting Innovators

The HKIEd, through the Department of Information and Applied Technology (IAT), has been very active in working with the EMB over the last five years to achieve the EMB’s ICT vision. Professional experience in working with teachers in many schools leads us to conclude that teachers need to develop the ability to reject unwarranted criticism and work around daunting and unwelcome barriers. School administrators need to reward and support proactive teachers to avoid them becoming easy targets from traditionally focused opponents who continue to resist change.

School leaders should encourage teachers to have a strong sense of mission and make a commitment to reconsider a lifetime of habits by modifying their current teaching methods in order to effectively incorporate the use of innovative ICT tools. Changes are necessary if teachers are to cater for individual learning differences of each student within their own classroom. From the administrators' standpoint, teachers in the schools have to be 'pushed beyond their comfort zone' to look at every aspect of their face-to-face teaching in order to assess the appropriateness for teaching and learning when using any of these tools.

Since the need to encourage teachers to adopt and use ICT to enhance classroom activities cannot be underestimated, the HKIED would suggest focusing on teacher beliefs and their self-efficacy in making these pedagogical changes. Changing teacher beliefs require support and encouragement. Some whole school strategies should focus on emphasizing that ICT can:

- make learning more interactive;
- enhance the enjoyment of learning;
- individualize and customize the curriculum to match learners' developmental needs as well as personal interests;
- provide avenues for parents to be involved in their child's learning; and
- improve methods of individual student profiling and evaluation of progress.

Rather than using ICT for its own sake, teachers need to be encouraged by school leaders to work in teams to ensure that particular educational objectives can be achieved more efficiently, in more depth, or with more flexibility through use of appropriate technology. Recent work by Hong Kong Education City to develop teaching and learning resources that may be shared, reused and adapted by teachers needs to be extended to encompass all of the Key Learning Areas (KLAs).

Goal 4: Digital Resources for Learning – Digital resources will be continually enriched to meet school needs. Research on knowledge management strategies will be conducted to enable resources and curriculum experiences generated from various sources, local and international, to become more easily shared, updated, retrieved, customized and utilized.

There appear to be at least three issues with digital education resources – quality resources are insufficient; many are not relevant to the schools' needs; and retrieval is difficult. Encouraging publishers to turn textbooks into e-learning materials is not recommended as it would be rare to have publishers with a knowledge of learner-centred teaching and learning models, since this is not their core business. The perpetuation of 'page-turner' digital resources will not assist the vision toward a learner-centred curriculum. Partnerships with teacher education institutions would represent a far more appropriate partnership to assure that quality student-centred resources are created. The type of materials should focus on interactive activities.

Teachers are also finding "it difficult to identify and select digital education resources" (p. 5). In order to organize digital resources there may be a need to use more metadata for indexing the resources and cataloguing resources using international standards. The HKEDCity should carefully consider ease of use in the searching and the retrieval of materials. The role of librarians should be considered in the future development of the HKEDCity portal as they can assist in training searching and retrieval skills and with creating metadata, eg indexing,

applying standards and using library searchable terms. Librarians can also assist with intellectual property rights in relation to the digital resources.

Goal 5: Sharing and Continuing Professional Development - Evaluation and research will be conducted by practitioners and experts to identify effective strategies for it in education and distill the elements of successful pedagogies. Exemplars will be more widely shared among teachers. Research will also be conducted to establish effective models of professional development such that the process will not only help teachers gain knowledge and skills, but will also provide a structure and support for continuous improvement in the application of IT in education in schools.

Research

One key aim of all the information technology modules taught at HKIED is to provide student teachers with a good blend of theory, research, classroom practice and practical hands-on experience in the use of ICT in education, especially in the secondary schools. It is important that theory and research inform student teachers' development of hands-on skills with ICT. It is also important that the development of knowledge in theory and research be complemented by hands-on practical skills. Equally important is that student teachers will be able to translate theory, research and hands-on skills into good classroom practice, including the development of appropriate courseware and the creation of a nurturing learning and teaching environment in ICT.

While it is true that teachers must develop sufficient competence and confidence using ICT it is also very clear that achieving creative applications in the use of ICT will only be possible when teachers are given opportunities to explore and experiment with the various ways that ICT can be applied in educational contexts. Charles Crooke (1994) has said, "If we do not wish to see new technology transform the experience of learning into something solitary and dislocated, then we must demonstrate that it has a credible place in a more collaborative framework" (p. 223). Realising the EMB's vision demands that we demonstrate that ICT in Hong Kong schools is improving learning outcomes for all students. Developing collaborative approaches between EMB, schools and higher education institutions will be essential.

Norman (1998) has indicated that in any organisation there are people who are innovators (the 6% identified as creative in the EMB report), early adopters, late adopters, late majority and reluctant-adopters. The challenge is to develop programs that enable people to cross 'the chasm' of technological and pedagogical risk-taking in a supportive environment. Collaborative, project-based and action-learning approaches may offer a fruitful direction for professional development.

Goal 6: Community-wide support and Community Building - The community, in particular parents will be involved and encouraged to motivate children towards appropriate use of IT and drive home messages on cyber ethics.

The centrality of the school leader and teacher's role cannot be underestimated. However community-support and parental support should also be emphasised. Change strategies arising from external reforms must take into account the fact that all schools are different. The focus for change needs to include the management arrangements of the school as well as specific curricular or pedagogical issues, parents and community values. Change strategies must take account of the patterns of collaboration in which the school is located and the roles

of a variety of stakeholders and partners. There needs to be an appropriate balance between ‘top-down’ and ‘bottom-up’ strategies.

Summary

Stephen Heppell (1993) argues that there have been four stages in the development of computers over time, with a fifth stage in progress. The educational community and society world wide have moved from the question of “what is a computer?” to “what can I do with a computer?” These stages are shown in Figure 2. The pedagogical issues articulated in this discussion are now paramount if the IT strategy is to realise its potential for improving student learning outcomes and realising the investment in hardware and software made by the EMB over the preceding 5 years.

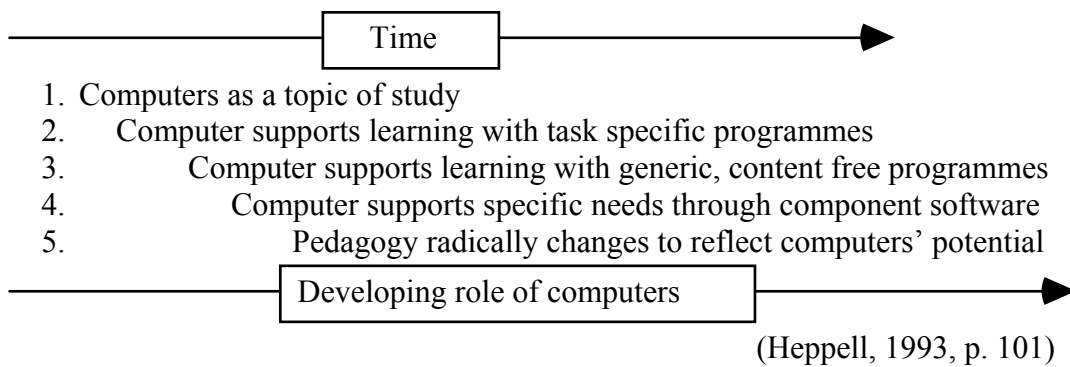


Figure 2: Computers as learning tools

We suggest that any developmental work with ICT must be designed to undertake careful foundation work with a small number of schools in a systemic and systematic approach. A focus on developing a select number of exemplary schools will strengthen the diffusion of innovative approaches to other schools. The HKIEd recommend that the implementation timetable should consider this approach. The importance of taking an approach that has a chance of engaging deeply embedded change cannot be underestimated if the policy makers and decision makers truly wish to go beyond surface change.

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