Research into Practice, Researching Practice of ICT in Education: the Second Wave?

Nancy Law
nlaw@hkusua.hku.hk

Abstract

Hong Kong has just completed its first five year plan on Information Technology in Education (ITE) and is about to launch its second five-year plan. This paper examines the difference between the two policy documents in the context of global trends in ICT policies and practices and discusses the challenges for the next phase of ITE developments in Hong Kong. The paper proposes the establishment of a network of practitioner researchers and academic researchers who interact, share and build on each others' work as an important strategic component in our next steps forward to achieve the goals in the next phase of development.

Introduction

Examining the two Information Technology in Education (ITE) policy documents Hong Kong, the first five-year strategy (EMB, 1998), *Information Technology for Learning in a New Era* released in November 1998 and the consultation document for the next five-year plan (EMB, 2004) *Information Technology in Education - Way Forward* released in March 2004, one has a strong sense that there has been significant progress over the last five years. More easily discernable are the significant improvements in the technological infrastructure now available in schools, and the information literacy levels of teachers. There has been a lot more experience and resources built up for IT implementation in learning and teaching. However, the most significant change is in the understanding, vision and outlook related to ITE as reflected in these two documents. This last category of change is more difficult and more significant for the longer term development. This paper examines in detail the vision and goals of the two strategic plans to identify their key differences as an outcome of learning from our experience and a consequence of reflecting on our practice in the context of research on ITE conducted locally and internationally. It then discusses how establishing and nurturing a network of practitioner researchers in partnership with academic researchers may hold the key to fasten our learning cycle as we venture to realize the new educational goals set up for the second five-year plan.

The first 5-year plan: braving the future with faltering goals

The vision for ITE in the first five year plan reflected very much a novice view of the potential and rationale for integrating information and communication technology (ICT) in the school curriculum. There were four key goals put forward:

- to turn schools into dynamic and innovative learning institutions,
- to link up students with a vast network of knowledge to achieve a broad knowledge base,
- to develop students' capability to process information effectively and efficiently and
- to develop students' attitude and ability for independent life-long learning.

At the surface, these appear to be perfectly good goals and these have also been goals that enthused researchers

in both computer science and education in their innovations and explorations to harness the potential of ICT for learning and teaching. It is only when one reviews the research findings internationally and locally that one may begin to appreciate the theoretical and implementation underpinnings associated with these goals and their inadequacies.

Making learning more interesting and effective with ICT

Let us start with the first goal, using ICT to make schools more dynamic and innovative. So the focus was on achieving learning outcomes that are already well established in the existing school curriculum. The assumption was that 'IT has the potential to liven up classroom life ….. to facilitate more effective teaching and learning and development of a creative mind' (EMB, 1998). The premise was that the new medium would make learning more fun. However, a vision that the world of learning would become much easier and much more enjoyable primarily through 'edutainment' products has not been realized. Blurton (2000) reported consistent evidence that ICT-mediated instruction using conventional teaching methods was not any more effective than traditional face-to-face instruction. Technology would not be able to improve learning if it is only perceived as a different medium. Research in the psychology of learning has found that deep learning would only happen through deep engagement. Furthermore, the nature of the difficulties faced by learners may be different depending on the subject domains as well as individual characteristics of the learners. There are many examples of good learning technology that have been found to have significant impact on learning (Jonassen et al 1999, Jonassen 2000). However, good learning technologies are only possible if their design is underpinned by a good understanding of how people learn (Bransford et al 1999).

The successful deployment of good learning technologies does not only depend on their availability. Law et al (2003) found from the Second International Information Technology in Education Study Module 2 (SITES M2) case studies of innovative pedagogical practices using technology that even in these exemplary case studies collected around the world, most of the ICT tools used were general-purpose tools such as the office productivity tools, rather than tools that were designed for specific education goals or for supporting specific learning processes. To explain how this situation might have arisen, Law et al (2003) claimed that teachers had to overcome an even greater hurdle in implementation if they were to use pedagogically sound technology tools effectively to support pedagogical innovation. They thus concluded that

> 'In order for teachers to effectively use ICT to achieve the educational goals for the 21st century, two important criteria have to be satisfied. First of all, teachers have to recognize that the use of ICT tools is not value free and there are often deep pedagogical assumptions embedded in their design and use. This has important implications for the choice of ICT tools and resources in schools as well as in the nature of the professional development provisions for teachers. Another issue relates to the design and dissemination of education-specific ICT tools and resources. While the relatively low level of use of specialized ICT tools may imply that there is a lack of availability of such tools, a more important fact probably is that such tools do not "travel" well. While the general ICT tools like internet, office and multimedia tools are marketed with great vigour, and are dominated by a few key products, there are no education-specific tools and resources that are widely known even within the education circles.'

Exposing students to a vast network of knowledge and to help them develop effective and efficient information processing capabilities

These two goals are related and very much in line with what many believe to be at the heart of the challenge of the information age: information explosion and the need to be able to use them effectively to solve new problems. It has been found in the SITES M2 study that most of the case study reports were *projects* (Kozma et al., 2003, Law et al., 2003). This is not surprising as this form of learning organization potentially offers more open learning tasks that give students the opportunities to take on more responsibilities to define learning problems and to solve them. However, it was also been found that project as a label for an activity format can be used in very different ways, involving totally different process and achieving rather different outcomes (Law, Lee, & Chow 2002). Simple cut-and-paste technology can make information search, selection and presentation easy tasks but may not lead to significant learning. Bereiter and Scardamalia (2003) examined three popular formats of organizing open, enquiry oriented learning: learning by design, project based science and problem based learning and pointed out that even though these may not lead to improved understanding if the focus is not on improvement of ideas during the learning process but on the completion of tasks or creation of artifacts per se.

The effectiveness of one's information processing is only assessable and meaningfully developed within the context of engaging enquiries that carry personal meaning to the learner. The learner has to become a self-directed enquirer capable of defining their own learning goals and monitoring their own progress rather than awaiting instructions on tasks assignments. The teacher's primary role will no longer be that of the content expert or task master and assessor, but that of role modelling and facilitating collaboration and enquiry. This change in the roles of teachers and learners has been described as emerging pedagogies of the information age (Pelgrum & Anderson, 1999).

Lifelong learning v.s. self-paced independent learning

Supporting the development of lifelong learning capability has become one of the most popular justifications for ICT implementation in the curriculum. However, this term may be interpreted very differently with disparate implications. The interpretation as reflected in the first five-year plan is that 'IT will motivate and empower our students to learn at their own pace and help them develop habits of self-learning, …'. Here the focus is on self-motivated, self-accessed learning, but the focus of learning is still very much on acquisition of knowledge as an individual endeavour and is very different from the kind of emergent paradigm discussed in the previous section.

It is not difficult to see, at least with hindsight, that the vision and goals for ITE set up in 1998 were not grounded on good theoretical understanding or on research findings from practice.

The second five-year plan: IT as a lever for educational change

In contrast to the first five-year plan, the second plan as laid out in the consultation document has a remarkable clarity and consistency, focusing sharply on bringing about deep curriculum and pedagogical changes through the use of ICT. The new vision was to use IT as a lever to support and advance the Education Reform, and the specific goals were:

- empower learners with IT for creative problem solving,
- empower teachers with IT to innovate and to take on new roles,
- enhance the leadership capacity of schools for the knowledge age,
- build up digital resources supported by research on knowledge management,
- sharing and continuing professional development,

- community-wide support and community building.

Establishing appropriate and effective ITE policy and strategies is a high priority not only for Hong Kong, but also for many other countries, in the context of ensuring national competitiveness in the global economy. The 'ICT in Education and Training' working group of the European Commission released a progress report in November 2003 (European Commission, 2003) containing four recommendations for education policy makers in the EU on the basis of extensive research conducted in the region. Three of their four recommendations were in fact similar to the goals expressed in the ITE consultation document in Hong Kong. Their four recommendations were:

1. embed ICT policies and strategies into long term educational objectives,
2. ensure new support services for education,
3. empower educational actors and train for the management of change,
4. develop research, indicators, access to results and specific fields of application.

The similarity in outlook between the two documents of course does not guarantee that the goals put forward in the consultation documents are appropriate or achievable. However, it does reflect that Hong Kong has, over the last 5 years of implementation, been able to learn from that experience and achieved remarkable change at the system level. This, I argue, is the consequence of the conscious efforts at the system level to undertake and learn from research as a means of communal reflection on practice, as well as the numerous efforts of many practitioners, particularly teachers in primary and secondary schools, to experiment on new ways of using technology, translating 'research into practice'. One could have wished there had been better understanding and foresight when Hong Kong's first five-year plan was drafted. However, what the document reflected was not merely the views of those who had the direct responsibility of writing the document. It reflected the views of many in the education community at the time. As a large scale social endeavour to venture into the unknown and to break new ground, ITE policies and their implementation are necessarily experimental, and there will always be lessons to be learnt on the way. However, if we see this process as learning for the whole society, the challenge is not only in making better learning decisions, but even more importantly, how to ensure that the whole society, particularly those in the education community, is able to learn deeply and progress effectively through that process.

The progress reflected in the changes across the two five-year plan is a tribute to the learning achieved through the efforts of many who contributed much of their efforts and energies to the enterprise. However, learning does not occur simply as a result of engagement in action, nor just from reading the findings of research generated from other countries. The cycles of reflection on action for improved action would not be very effective or efficient if the learning cycles are conducted as individual or isolated events. The challenge is for the education community to develop into a self-learning, self-improving organic entity. This can only be effectively achieved through the establishment of structures and mechanisms to identify and support a variety of research activities to be undertaken by education practitioners as well as academic researchers, and to ensure that there is vibrant interaction, sharing and partnership in our steps forward. This concept will be elaborated within the framework of leadership and change in the next section.

A Model of Leadership and Staff Development for Innovation and Change: Knowledge Building through a Network of Practitioner Researchers

Findings from the SITES M2 study demonstrate clearly that dissemination of innovation and good practices cannot be accomplished through a process of replication. The 'adopters' have to engage in a process of innovation in their own context (Pelgrum & Law, 2003, Law, 2004). There is a lot of literature that discussed the importance of leadership for educational change and innovation in general (Fullan, 1993; 1994) and innovations involving the integration of ICT (Lankshear et al., 2000). These all point to the importance of shared vision and responsibility within schools such that leadership has to be coupled with a strong sense of personal mastery for each of the individuals engaged in the innovation (Senge et al., 2000). Yuen et al (2004) has taken this concept of leadership further in building up a model of multi-level e-leadership. ITE initiatives are resource and expertise intensive, and their implementation impinges on all aspects of the curriculum from intended goals to assessment practices. While schools are the focal unit of organization for implementation and change, alignment and coordination in terms of vision, strategy and implementation support with system and regional levels initiatives and regulations are essential. Partnership and shared leadership across the various levels of the education system from policy makers through EMB personnel, principals, technology coordinators, subject panels to individual school teachers so that they all share in contributing their commitment and creative energies to the enterprise are necessary to make effective progress.

The concept of multilevel leadership is not complete if it is confined to partnership across different levels within an institutional hierarchy. It is a network (or matrix) concept so that partnership is also forged among similar actors (or stakeholders) across institutions. Cross-institutional communication and partnership may not impinge on implementation and practice directly, but are critical to ensure that we do not end up with just pockets of innovation, but a community of practice that learns together.

The concept of multilevel partnership in leadership even within an institution is still an unfamiliar one. To put this concept into practice for the broad education community could only be wishful thinking if it is not supported by the establishment of appropriate structures and mechanism. The structures and mechanisms referred to here are not strict organizational ones that constrain practice. Rather, these should be established with the primary goal of supporting research and learning within and across schools and sectors. It is proposed here that a Network ITE research for education innovation be established to support the partnership in multilevel eLeadership in Hong Kong. Practitioners and other actors in the education system engage as researchers to contribute to innovation and reflection on practice as well as to seek research advice and peer support for their endeavours. The Network should also play an active role in fostering sharing and partnership through various means. This Network should contribute to strategic planning of ITE related continuing professional development initiatives so that the latter can be aligned with and supportive of eLeadership development needs.

Researching Practice and Research into Practice: towards the institutionalization of new norms and new work practices for 21st century schools

The inaugural issue of *Information, Technology and Educational Change* (ITEC) is launched at a significant moment in the history of information technology (IT) developments in education in Hong Kong. The first five-year plan for IT in Education (ITE) launched in November 1998 was completed and the consultation period for the draft second five year plan has just closed. The launch is to be made at the third CITE Research Symposium (CITERS), an annual event for sharing among practitioners, researchers, policy makers and implementers. One of the main goals of CITERS is to nurture and showcase the research outcomes from practitioner researchers.

This type of research is still rare and the strengthening of which would contribute much to the next phase of ITE developments in Hong Kong. In one sense, ITEC and CITERS are contributing towards the establishment of an informal network of researchers. It is very much the hope here that these beginnings will be strengthened by further initiatives to realize the goal of *the "Second Wave" of ICT in Education: from facilitating teaching and learning to engendering education reform,* the theme for the International Conference on Computers in Education held in Hong Kong in December 2003.

References

Bereiter, C., & Scardamalia, M. (2003). Learning to Work Creatively With Knowledge. In E. De Corte, N. Verschaffel, N. Entwistle & J. van Merrienboer (Eds.), *Powerful learning environments : unravelling basic components and dimensions* (pp. 55-70). Amsterdam: Pergamon.

Blurton, C. (2000). *New Directions of ICT-Use in Education*, UNESCO World Communication and Information Report. Paris: UNESCO.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (1999). *How people learn: brain, mind, experience, and school*. Washington, D.C.: National Academy Press.

EMB (Education and Manpower Bureau HKSAR). (1998). *Information Technology for Learning in a New Era: Five-year strategy 1998/99 to 2002/03*. Hong Kong. http://www.emb.gov.hk/index.aspx?langno=1&nodeID=423 (accessed June 30, 2004)

EMB (Education and Manpower Bureau HKSAR). (2004). *Information Technology in Education - Way Forward*. Hong Kong. http://www.emb.org.hk/ited/consultation_ited/eng/ (accessed June 30, 2004).

European Commission. (2003). *Implementation of "Education and Training 2010" Work Program, Working Group "ICT in Education and Training" Progress Report*. Brussels: European Commission.

Fullan, M. (1993). *Change forces : probing the depth of educational reform*. London: Falmer Press.

Fullan, M. G. (1994). Why Centralized and Decentralized Strategies Are Both Essential. In R. J. Anson (Ed.), *Systemic Reform: Perspectives on Personalizing Education*. Washington D.C.: OERI, US Dept of Education.

Jonassen, D. H., Peck, K.L., & Wilson, B.G. (1999). *Learning with Technology*. Upper Saddle River, New Jersey: Merrill.

Jonassen, D. H. (2000). *Computers as Mindtools for Schools* (2nd ed.). Upper Saddle River, New Jersey: Merrill.

Kozma, R. (Ed.). (2003). *Technology, Innovation, and Educational Change: A Global Perspective*. Eugene, OR: ISTE.

Law, N. (2004). Teachers and Teaching Innovations in a Connected World. In A. Brown & N. Davis (Eds.), *Digital Technology, Communities and Education*. London: Kogan Page.

Law, N., Lee, Y., & Chow, A. (2002). Practice characteristics that lead to "21st century learning outcomes". *Journal of Computer Assisted Learning, 18*(4), 415-426.

Law, N., Yuen, H. K., Chow, A., & Lee, Y. (2003). *A comparative study of 'Innovative Pedagogical Practices Using Technology': a secondary analysis by the Hong Kong Study Centre*. Hong Kong: Centre for Information Technology in Education, University of Hong Kong. http://sitesdatabase.cite.hku.hk/online/index.asp Accessed: June 30, 2004.

Pelgrum, H., & Anderson, R. (Ed.). (1999). *ICT and the Emerging Paradigm for Life Long Learning*. Amsterdam: IEA.

Pelgrum, W. J., & Law, N. (2003). *ICT in education around the world: trends, problems and prospects*. Paris: IIEP.

Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B, Dutton, J., & Kleiner, A. (2000). *Schools that learn: a fifth discipline fieldbook for educators, parents, and everyone who cares about education*. New York: Doubleday.

Yuen, H. K., Fox, B., & Law, N. (2004). Curriculum Innovations and Multi-Level e-Leadership Requirements: Putting Research into Practice. *Asia-Pacific Cybereducation Journal, 1*(1), 1-12.