

# ICT and Future Teachers: Are We Preparing For E-learning?

Anthony J. Jones

Department of Science and Mathematics Education  
The University of Melbourne  
Victoria 3010  
Australia

a.jones@unimelb.edu.au

*Keywords:* teacher, education, pre-service, employer expectations.

## Expectations

It is now common for relevant authorities to insist that all newly qualified teachers are able to use a range of ICT applications for teaching and administration (SCTP 1999, NCATE 2001, DfEE 1998). The Australian government has published several papers containing plans and strategies for bringing schools and teachers into the information age (DETYA 2000, DEST 2002). The former, under the title "Learning in an online world" includes:

*Introduce strategic initiatives into teacher pre-service education to improve the ICT competence of commencing teachers.*

*Develop teacher competency standards in using ICT in curriculum practice and incorporate teacher ICT standards into human resource management within education authorities and individual schools, including recruitment and promotion practices.*

(DETYA 2000: 52)

The more recent paper, under the general heading of "Pre-service," states:

*For teacher education institutions to be able to train and graduate beginning teachers who have the necessary knowledge, skills, understandings and attitudes to make effective use of ICT in their teaching practice, a number of capabilities need to be in place. These can be categorised as:*

*leadership and vision in the use of ICT;*  
*infrastructure providing appropriate access and technical support;*  
*curriculum/programs that integrate the use of ICT;*  
*partnerships with schools to provide appropriate professional experiences for pre-service teachers;*

*competence in, and understanding of, the effective use of ICT for teaching and learning by teacher education staff.*  
(DEST 2002: 14)

The Department of Education and Training in Victoria (DE&T), in a professional development section of its website, has an outline of ICT capabilities that could be expected of teachers. Included are:

*using and managing technology*  
*using basic computer applications*  
*using desktop publishing and presentation software*  
*using multimedia*  
*using communication technologies*  
*using learning technologies in the key learning areas*  
(DE&T, 2002)

These documents, from both Australia and overseas, make it abundantly clear that every teacher is now expected to be capable of competently and effectively using the ICT and other learning technologies currently available in schools. But what of advances such as e-learning that are not yet widely used?

## What is E-learning?

The documents referred to previously do not specifically mention e-learning, instead using terms such as online and flexible learning. Depending on the definition chosen, e-learning has been used for training in the business context for many years, although its current significance is due to improvements in web-based communication technology. Business oriented e-learning providers accept that they primarily offer training, as evidenced by definitions such as *e-learning is online training that is delivered in a synchronous (real-time; instructor-led) or asynchronous (self-paced) format* (KnowledgeNet 2002). E-learning, digital learning, computer enhanced learning, no matter which tag is applied, all aim to exploit web-based technology to improve learning for students. Improvement is seen as a consequence of enhancing traditional face to face room-based learning through the use of technology that employs different modes of delivery and can cater for thousands of students in geographically different locations, learning at different times, while allowing for inexpensive and on-going updating of content.

## **Why Should Teacher Education Be Concerned With E-learning?**

The initial response to this question is obvious when we consider changes in our society, especially changes in schools and universities. New housing developments have cabling for computer use included as part of the infrastructure. Students from these developments live in houses and attend schools that are prepared for the revolution in information access brought about by the world wide web. At school and home, e-learning will be a fact of life for these students, supplementing rather than replacing traditional schooling and life long learning as currently practiced.

Australian schools have already taken on many aspects of computer enhanced learning. However the majority of formal learning still occurs through the sharing of spoken and written words in a room with peers and a teacher. More critically, the majority of web use consists of searches for isolated packets of information for the learner, but directed by the teacher. Most teachers are unable to integrate ICT use into their everyday classroom practice. However, in 2003 Australian teachers can no longer claim that they do not use computer enhanced learning because of a lack of access to appropriate technology.

### **A Vision of the Future for Teachers**

In the foreseeable future teachers and learners will not be anchored to classrooms as they make appropriate use of various forms of computer enhanced learning. The traditional positioning of teacher at the front of a classroom with students at tables around, but basically facing the teacher, will be only one of many learning situations to be used each day. Similarly, the traditional expository mode of teaching will become just one of several modes learners and teachers will switch between depending upon their particular needs. At different stages of a lesson students might work as a whole class, in small cooperative groups, in pairs, or individually. Life long learning for teachers beginning their careers early in the 21<sup>st</sup> century will require that they are able to make effective use of all of these combinations.

The use of cooperative or collaborative groups to solve problems appears to be a trend in both work and education. A major difference of course is that work-related problems are real life issues that have to be solved, while education problems are simulations or hypothetical, contrived situations. However the use of problem-based learning (PBL) in schools and universities is becoming more common, and will increase as long as it remains a practice in business and industry. In addition to assessing the work of students for content related matters, teachers of the future will also assess more formally the ability of students to work in groups and to make use of the most appropriate of the technologies available.

Finally, teachers in the future will make even more use of ICT for professional activities including lesson planning and preparation of teaching materials, recording student assessment and other administrative tasks, and their own professional development and continuing education.

Teachers already produce design briefs and worksheets using word processing, but this will change to encompass web-based material as the electronic screen slowly replaces printing on paper. Materials for units of work will not be printed, will increasingly not be burnt onto a CD, but will be placed on a public website and will incorporate many links to a wide variety of other relevant web sites. Teachers, working in collaborative groups that might cross school boundaries, will develop this material. A recent decision by Massachusetts Institute of Technology to provide free public access to all course materials is the forerunner to education systems and individual schools following suit.

### **Bringing the Vision to Reality**

To a large extent the tools, educational theories and pedagogic constructs necessary for this vision already exist. Unfortunately, mainly because teachers have not been trained to use them, these things are rarely implemented in the same place at the same time. Schools are beginning to make use of wireless technology for computers, especially wireless local area networks (WLAN or LAWN) that enable connection to remote servers without the constraint of cables. Newer laptop computers with more efficient batteries will enable WLAN technology to operate almost anywhere on the school campus. Perhaps, at least for a while, schools will go back to having sets of laptop computers stored on trolleys that can be moved to any part of the school. Eventually laptop computers will be replaced by something even more portable and offering more flexibility, perhaps handheld technology. Jeremy Roschelle and the WILD Team at SRI International have investigated teaching and learning with handheld devices, and report that the benefits far outweigh current limitations (Roschelle and Pea 2002).

Concepts such as 4MAT (About Learning 2001) will be used to help teachers devise learning experiences that don't just allow for different learning styles, but instead actively encourage students to learn to learn in a variety of modes and groupings. When using a model such as 4MAT teachers follow a series of steps that ensure different learning and teaching styles are seamlessly interconnected into practice. To assist future teachers it is necessary that education systems, the employers, indicate to teacher education providers which models they would expect teachers to follow. Australian schools currently make use of a diverse collection of theories and methods, including all or part of Bloom's taxonomy, Gardner's multiple intelligences, de Bono's thinking hats, constructivism and 4MAT. While all of these have been adapted to include student and teacher use of ICT, technology is in reality an "add on" rather than one of the fundamental building blocks. However a more significant problem relates to the inconsistent use of these ideas across education systems. It is impossible to properly prepare new teachers, and to offer professional development to existing teachers, when there is no systemic agreement on which ideas will be used at what levels.

In England there is already a curriculum for beginning teachers that specifies skills and processes related to each subject and each level. Teachers are expected to be able to teach the ICT content and skills their students will need to use, as well as develop and implement lessons making effective use of ICT (DfEE 1998). Such a curriculum can allow for different approaches in different subjects.

## Conclusion

The future of teaching is largely in the hands of the teacher education providers. Teachers are still the portals through which students are given opportunities to incorporate appropriate forms of computer enhanced learning. No matter what educational systems mandate and expect, in the end effective learning is very dependent on the competence and will of the teacher. Preparing teachers for a technologically rich future is difficult because new teachers have not only to acquire proficiency in using technology for educational purposes, they also have to undergo a revolutionary revision of the practices of classroom teaching and learning. Chalk and talk will never be replaced while teachers and learners meet face to face. However future teachers will spend less time with a piece of chalk in their hand and more time with a handheld electronic device or a mouse.

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