The Globalisation of Education Through Teacher Education with New Technologies: A View Informed by Research

By Niki Davis

By 2040, when today’s young teachers will be ending their teaching career, it is reasonable to expect those global issues relating to the environment and to cultural diversity to be a major focus in education. Therefore it is relevant to help today’s students prepare to use Information and Communication Technologies (ICT) to bring pupil’s respect closer for apparently “distant” lands and cultures. The paper draws upon extensive research across Europe in collaboration with universities and commercial organisations. This paper argues that there are three reasons to incorporate a global dimension in teacher education:

- the context for education is becoming global;
- ICT is being used to increase access to education on a global scale;
- a global view can enhance teacher education through the provision of stimulating rich contexts for critical reflection.

The paper provides and also incorporates a set of principles to inform curriculum design and illustrates ways in which teacher educators can proceed. This includes a creative project to facilitate practicing teachers use of research into ICT in education.

Initial teacher education aims to prepare beginning teachers for a career that may last for over 30 years. Already too much has to be squeezed into the programmes of study and practice and yet this paper dares to suggest the addition of another dimension. The introduction and infusion of information and communications technology into programmes of study in universities and on placement in schools has raised major challenges that include substantial organisational and professional development (President’s Panel on Educational Technology, 1997; Veen et al 1998). In Europe teacher education as an agenda item has moved centre stage along with information and communications technologies. The need to fit education to the 21st century has brought with it a more mature understanding of the challenge to integrate new technologies. It appears that some governments, including the UK and Portugal, are beginning to glimpse the inequalities, as well as the potential, that novel forms of communication can engender.

A common theme through current innovations in teacher training is the deployment of ICT to enhance collaboration and, with students taking more responsibility for their own professional development, collaboration across organisations and towards shared complementary goals. I have led a collaborative project called “Telematics for Teacher Training (T3)” across seven European countries which shared and developed practice for teachers in many disciplines in secondary education as well as primary teachers. In the USA a range of initiatives have included both school-focused projects and exciting professional partnerships between schools and universities. For example the University of Virginia’s programme strategically ensures that student teachers can learn about technology integration while assisting teachers who are exploring new ways of using new technology. Iowa State promotes an approach of “reciprocal mentoring” led by Ann Thompson, the current president of Society for Information Technology in Education (SITE) (Thompson et al, 1998).

Drawing upon this experience, I suggest that this collaborative approach needs also to become an explicit part of teacher education institutional goals, such that students and their mentors learn to collaborate across cultures.

These teachers and institutions can develop partnerships that include nurturing of a diversity of cultures and their languages.

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Let us now take these arguments in more detail before illustrating ways in which a global dimension could be incorporated in programmes of teacher education.
GLOBALISATION
As teacher education moves towards more complex organisational arrangements of collaboration and competition at different levels, we are following similar trends in commerce and industry pushed and pulled by Globalisation. Dauphainais and Price (1998) edited the views of prominent chief executives under six themes, with the first as Globalisation. The others were radical change, leadership, culture, innovation and customer service. The five latter themes are already challenges in teacher education. This paper suggests that we must also face up to our role in the globalising of our cultures as workers across the world struggle for job retention and standard of living enhancements made possible through the “uncoupling of the corporation from the nation state. Rapid free flows of technology, capital, and employment contribute to this “global village” “effect.” (p 21)

I am not suggesting that the need for a global dimension arises from a widening of our markets, at least not yet. Recent research shows that an international market, such as pursued by multinational companies and their agents, has not yet emerged (Davis et al, in press). As part of our large European project “Telematics for Teacher Training,” we investigated the feasibility of providing services for ICT in teacher education. We found that, although the “market” is starting to emerge in countries such as the UK with initiatives such as Lottery funded teacher training, the majority of teacher training is funded though grants to institutions and is thus not available to others. However, Robin Mason (1998) does provide case studies of the implementation of “globalised” courses in higher education in other disciplines.

The first case for a global dimension arises from the connection with the multinational organisations’ activities. Our societies are becoming global and education must adapt to this new context, including improving multicultural education. Morrison (1995) noted a second reason. Globalisation of economic activities is forcing all nations to establish wider access to learning using communications technologies to create an “educational options map” involving the cost, scale, quality, relevance, portability, futurity, flexibility of an access to education.”

Finally, this paper suggests that a global dimension in teacher education does have the potential to enhance quality. Opportunities for critical reflection are improved when students and staff are engaged directly in comparison and contrast of approaches and cultures.

REFLECTION
The value of a global dimension to teacher education can be underpinned by theories of reflection. There is widespread acceptance that reflection is a crucial element in the professional growth of teachers (Calderhead & Gates, 1993). Hatton and Smith (1995) draw out four forms of reflection in a hierarchy: descriptive writing; descriptive reflection; dialogic reflection; and critical reflection. In the highest level, critical reflection, student teachers’ accounts of teaching are referenced to broader historical, social and/or political contexts. It is this most complex form of reflection that may be seen to benefit from a global dimension. A student is likely to find meaningful and rich contexts and problems with which to engage in that challenge their assumptions of educational practice. As described later teacher educators are able to deploy ICT to provide rich cases and contexts for reflection across pedagogies, disciplines and cultures. These are linked to a constructivist approach. Exeter University has collaborated with others in developing and researching the application of communication technologies to promote reflective practice in initial teacher training (Admiraal et al, in press) However, John McShea in his PhD thesis (1999) notes that this requires careful planning:

In Telematics [ICT] environments, a particular constructivist stance establishes how learning might be effectively supported. This has implications for the pedagogical structures which needs to be supported and thus what may need to be designed into a system. The educational framework of that design supports certain types of interaction... The nature and support for guided participation through Lave and Wenger’s (1991) views of legitimate peripheral participation also have implications for the design of communication systems such as who is in control; for how long, and how roles are to be managed. (p23 in final draft)

PRINCIPLES FOR TECHNOLOGY IN TEACHER EDUCATION
Having established the value of a global dimension to teacher education, I would like to take an opportunity to reflect on how such a dimension can be incorporated in teacher education. Colleagues in the USA, led by Jerry Willis, were drafting principles of ICT, or technology, in teacher education in response to a call from Washington DC. The three principles are phrased for use throughout the world:

1. Technology should be infused into the entire teacher education programme.
2. Technology should be introduced in context.
3. Students should experience innovative technology-supported learning environments in their teacher education programmes.

These are followed by six proposed actions to which I suggest the addition of a seventh:

1. Identify and make public positive models of technology-infused teacher education programmes.
2. Encourage and support collaboration of teacher education programmes with model technology-rich K-12 schools that can serve as authentic environments for teacher education.
3. Establish two to three national centres for technology and teacher education.
4. Support innovative models of faculty development.
5. Support models of technology infusion.
6. Fund the development of promising teacher education materials.
7. Encourage the incorporation of a global dimension into programmes and organisations.

Students connected through communications technology should be supported and encouraged to critically reflect upon global issues. The significant professional and organisational development of colleges and K-12 schools stimulated through this action also has the potential to support...
profound changes in multicultural dimension of teacher education and our societies.

**RESOURCES FOR A GLOBAL DIMENSION**

A global dimension includes the development of multicultural understanding. Kathleen Sernak and Carol Wolfe, in their recent paper reporting on the use of email for this purpose, provide a review of the literature noting that “theorists understand multicultural education as transformative, calling for a re-evaluation of ingrained values, beliefs and assumptions that influence educational policy.” The course supported email connections between pairs of students in different cultures while they studied multicultural education: one in at a societal level (macro) and the other taking a school perspective (micro) to stimulate intellectual growth and build a community. They report that pedagogy assisted students’ construction of knowledge:

> Becoming a “critical multiculturalist,” therefore, links the theory of liberatory pedagogy with the practice of constructing knowledge through student’s “experience, self-awareness, and self concept to alter the cognitive filter in order to construct a different reality.” (p306)

Other approaches have started with the creation of resources to stimulate and to structure reflective practice. For example, Bob McNerney has led the creation of a large variety of cases of educational challenges set in many different cultures and countries and stimulated the approach through competition. He continues to explore the added value of communications technology and multimedia in the process, most recently deploying a web-based environment (Bronack et al, in press).

In Europe we have also used email, although not in such great depths as Sernak and Wolf. More recently the European Commission has supported the development of ICT to collaboratively research and to develop courses and resources for teacher training. The evaluation of all three major EC projects points to the need for overt attention to a dimension which enhances understanding of other perspectives, cultures and languages (Davis & Taylor, 1999).

**T3 CORE CURRICULUM PRINCIPLES FOR ICT DEVELOPMENT**

It is possible to bring into play principles that can provide a means to reconstruct education with ICT. A holistic set of principles was developed and researched in a collaborative international process during the European Telematics for Teacher Training project with support from teacher educators, policy makers and commercial organisations. The production of a Core Curriculum for Telematics for Teacher Training was an objective written within the EU Framework IV agenda. Figure 1 shows the principles embodied in the T3 core curriculum for Telematics in teacher training. This framework was designed to assist policy makers, course developers, teacher trainers and other professionals who are considering the use of Telematics in teacher training. It is embedded into national and local infrastructure, culture and context, providing a framework upon which detailed curricula can be built. It also provides a durable framework with which these curricula can be kept up to date as new developments are forged in ICT and education.

The holistic principles are bound in a triangle that has three overarching dimensions: culture, global education and managing change. Culture includes both the local classroom culture and school ethos as well as the influences of regional cultures and language. An increasing requirement for a global view and the globalisation of our world, particularly under the influence of multinational companies and global environmental issues makes up the second dimension. Managing change is the third and applies to all aspects and the influence of ICT itself. Inside the considerations are split into three main categories: networking and collaborative competencies, pedagogical and technical considerations. The technical considerations in the end are the least influential, but it is increasingly clear that lack of the comfortable personal access to technology can form a barrier. Pedagogical considerations are already clear in many national curricula for pupils and for teachers, but least recognised are the new demands for networking and collaborative competencies. These are listed below:

- a critical understanding of the added value of learning networks and collaboration within and between countries
- an ability to participate effectively in open and flexible learning environments both as a learner and as a tutor
- an ability to create learning networks that bring added value to the professional development of teachers
- widening access and providing learning opportunities to all members of learning communities including those with special needs
- contribute to The European Learning Society and lifelong learning

Such work also provides significant resources for use in teacher education. For example the cross-curricular course for teaching environmental education on-line drew upon the “EuroTurtle” web site, which has materials for all levels of students from the university down to the primary or elementary school. Our partners in Italy created a multinational course (EUMedia) for groups of teachers studying simultaneously in four countries during the T3 project (Davis & Prosser, 1998). The most innovative aspect of the “EuroTurtle” web site is the on-line field trip. Importantly, that development is led by a teacher of biology who is convinced to the need to lead development of the Internet for education with an organic approach. Roger Poland has created the “EuroTurtle” web site collaboration with scientists in Scotland and Italy, and ourselves in the Telematics Centre (where he is also taking a part time research degree), Medaset (a charity keen to protect turtles), and the occasional commercial sponsor. Roger promotes a collaborative community with teachers in all continents. “EuroTurtle” is one example of the complex partnerships that can build up across continents and sectors to benefit education and the global community, including endangered species in the oceans of the world.

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1 Further detail is provided in Tetre and Davis (1999) and on-line in the T3 Showcase at HYPERLINK http://telematics.esa.c.u/uk/T3

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DISSEMINATING RESEARCH INTO EFFECTIVE USE OF NEW TECHNOLOGIES

Most recently the Exeter Telematics Centre has been developing a ICT Educational Research Forum (ERF) on the Internet in the UK is Virtual Teacher Centre. We aim to make research into ICT in education accessible to classroom teachers and to encourage them to join in with professional discussions. As we develop this concept we now acknowledge that it will be important to build in a global dimension, because without it users of the ERF will be less likely to understand the discourse as it is extended to research from other countries. We hope that teacher educators will come to the centre with their students and join in the developing communities there. The embryonic site adjacent to SITE is international web site hosted in Exeter at: http://telematics.ex.ac.uk/ERF/. The evolving design of the ERF is drawing from a number of genres in the aim of stimulating familiar modes of communications through multimedia: university seminar, radio interview, multimedia software and web forms and publication. The embryonic version of the ERF takes analogies with a building housing a research centre. It is both natural for us to use the building that houses our own centre and to manipulate digital photographs that remodel this into the ERF and the mode in which we wish our visitors and researchers to interact on-line. The quality assurance and management of the ERF borrows some of its underlying process from scholarly research journals. It has an Editorial Board of leading researchers in this field. However, it does not aim to publish articles as if they were papers in a research journal, because the presentations are aimed at users of research and so must be of more practical relevance speaking directly to the profession. Presentations in the ERF on educational research have borrowed their style from several genres: university seminars, radio interviews and multimedia packages. The flexible learning environment borrows aspects of library practice mixed with more standard web publishing. This eclectic style is brought together with the input of an designer experienced in a range of multimedia publications through our UK and European work.

CONCLUSION

This paper has described principles to inform the development of ICT in teacher education to assist adjustment to the challenges for education as society continues to move beyond industrial and information societies: hopefully towards a collaborative global learning society. Providing appropriate support for the educational profession to become more evidence-based and to gain its own autonomy and respect from governments and researchers of all disciplines will become an increasingly important part of the systemic process of change in the complex that make up education. Individuals and institutions need care and support appropriate to their stage of development. An attempt must be made to align the units within the complex system, so that the individuals and organisational systems may assist one another, rather than disrupt the process of education and its development. Our understanding of education has recently been informed by theories of complex systems (Davis & Dillon, in press).

This paper has argued three reasons to incorporate a global dimension in teacher education. The context for both our lives and for education will become more global than it already appears today – the concept of a global village is perhaps less of a reality than the environment that we share. ICT is being already used to increase access to education on a global scale, so all countries will need to infuse ICT into teacher training. In addition the paper has provided several examples of ways in which a global view can enhance teacher education through the provision of stimulating rich contexts for critical reflection. The T3 core curriculum provides the principles to guide such course redesign. This paper recommends that teacher trainers world-wide use these principles to inform redesign of their courses. They are also recommended to make the principles transparent within their courses so that tomorrow’s teachers can both experience and understand ways in which to incorporate a global theme into education through with new technology during their teacher training.

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