

TEACHER PERCEPTIONS AND USE OF ICT IN UNFAMILIAR CLASSROOM SITUATIONS

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Abstract

Based on findings from two quite distinct research projects, this paper proposes that the reluctance of some teachers to make ICT an integral part of classroom teaching and learning is, at least partly, a consequence of several factors beyond their control. This reluctance occurs even though most teachers use one more forms of social networking as part of their out of classroom lifestyle. Two particular examples of teacher reluctance to consider and use ICT as an integral part of teaching are presented and discussed. Both examples arose from recent research projects conducted in Australian schools, and it is argued that the teacher behaviour observed could be largely overcome with appropriate professional development.

Introduction

The idea of using ICT, at least in some part of the teaching and learning process, is now commonplace in most schools and colleges. ... Few practitioners, however fully exploit the possibilities for learning and teaching offered by technology. (Becta, 2007, p.3)

Initial teacher education courses in most countries tend to focus on the content of school curricula and the cognitive, physical and emotional development of the pre-adolescent and adolescent students. Today, in the second decade of the 21st century, teachers are expected to possess a variety skills, techniques, and knowledge that will enable them to apply a range learning technologies in their school classrooms. Although it is some three decades since teachers began using computers in schools, neither practitioners nor researchers fully understand the links that exist and develop between learners, their teacher, and whatever learning technologies they use.

In 2012 we might expect that new entrants into pre-service teacher education will have had many and varied experiences with ICT during their schooling. However the quality and extent of those experiences differ greatly and consequently there are some new teacher education students who have had few opportunities to use ICT for learning. A range of issues arising from the inclusion of mandatory computer-related subjects in pre-service teacher education courses, and of profession development for practicing teachers, are examined. Of particular importance are the feelings, beliefs and perceptions of new and experienced teachers about their ability to perform a range of computing tasks that might be considered not normal classroom practice.

It must be noted that there are various linguistic and cultural differences concerning terminology used for educational applications of technology. In this paper the term “information and communications technology” (ICT) is used as an umbrella term to mean any of the digital technologies used in schools to assist with aspects of teaching or learning. In other parts of the world ICT might be replaced by any one of IT, informatics or learning technology. Pedagogy or pedagogical strategies will be used to describe the work of teaching, including planning, implementation and evaluation. Finally, online learning will be used to include internet-based learning, learning with mobile devices together with learning that engages with any aspect of ICT.

Background

Over the past decades schools in developed and developing countries have been acquiring increasing numbers of computers for student use. At the same time the nature and style of educational software has changed dramatically. The first wave of educational software was characterised by text-based drill and practice programs that have been replaced by investigative or exploratory programs that often make extensive use of multimedia. One consequence of these developments is that teacher education programs have had to undergo significant changes in the way they approach educational computing.

Almost a decade ago the British Educational Communications and Technology Agency (Becta) published a report of an investigation into factors that restricted classroom use of ICT by UK teachers (Becta 2003). A survey of teachers at that time identified the major restrictions as a lack of teacher confidence in classroom use of ICT, and a perceived lack of access to quality resources (which included hardware, software, and professional training). Similar barriers to classroom use of ICT by teachers have been reported in more recent studies from a variety of educational systems, including Yildirim (2007), Drent and Meelissen (2008), Binglimas (2009) and Morris (2011).

Venezky and Davis (2002) conducted a project for the OECD that involved 94 case studies from 23 countries. They found that “successful implementation of ICT depends mostly upon staff competence in the integration of ICT into instruction and learning” (p.11), and noted that while it is rare for technology by itself to act as a catalyst for school change, technology can be a potent lever for planned change implementation. Discussing the Web and education they state that a “quality issue relates to the pedagogy employed in educational sites on the WWW” (p.33), and note that teachers who are neither aware nor competent with pedagogical strategies appropriate for using technology to enhance teaching and learning are unable to make effective use of what is available on the Web.

Method

In similar, but different, contexts to the two case studies presented in this paper, the author has investigated classroom use of ICT through video-recording and analysing lessons (Jones, 2010). This style of research has been implemented with primary and secondary school classes, and with experienced and beginning teachers. In both case studies data was collected in

several ways, including classroom video-recording, observations by the researcher, and interviews with teachers.

Throughout 2010 and 2011 the author participated in two research projects in which data on teacher use of ICT was collected. In one project teachers were encouraged to use Web 2.0 applications to connect with students from their class who were in hospital for extended periods but wished to continue their education. In the second project teachers in a suburban primary school were observed and interviewed about their perceptions of online and paper-based testing that their students were taking.

Research Projects

As an academic staff member of a university that promotes research, the author has been able to conduct research in local schools. Some aspects of two of these projects are of relevance to this paper. One research project was based at a hospital for children, in this case those up to 16 years of age. As a result participating students were available over the whole spectrum of primary and secondary schooling. The second project was undertaken at a government primary school located in a suburb on the northern fringes of Melbourne.

Case study 1: Hospital school.

From 2007 until the end of 2011 *Link 'n Learn* was a research project based at the Royal Children's Hospital (RCH) in Melbourne, Australia. The hospital caters for young people up to the age of sixteen years, and *Link 'n Learn* investigated how applications of digital technology could be used to connect hospitalised students with their teachers, schools and peers. The Education Institute is part of the RCH and has developed from a traditional hospital school. It has an interest in research, and was a partner in *Link 'n Learn* with Melbourne University's Graduate School of Education.

Link 'n Learn worked with students, both primary and secondary, who missed extended periods of school because of an illness. As soon as the medical staff agreed, members of the Education Institute staff contacted the young patients and discussed options for continuing their education while in hospital and at home recuperating. Some of these young people who wanted to use some form of digital communications technology to establish ongoing contact with their schools agreed to become part of *Link 'n Learn*.

While these students were willing to explore how to learn in an online environment, there was a much lower level of acceptance and use by teachers. Interviews conducted with teachers indicated that often they were reluctant because they felt they possessed neither the technical nor the pedagogical skills needed to translate face-to-face classroom teaching into one-on-one online teaching.

One of the most significant findings from *Link 'n Learn* has been the almost unanimous desire of young people forced to miss school because of a chronic illness to continue their education. The resilience shown by these young people in overcoming uncertainty and pain as they struggled to study was unexpected by any the researchers, the medical staff, or parents. This finding

needs to be utilised and built on in order to assist current and future young people hospitalised with a chronic illness. Digital communications technology such as video conferencing has been used to connect hospitalised young people to schools, teachers, and peers. This led to instances of intermittent visual contact between young people and some of their peers.

Online teaching. An unexpected teaching/learning problem confronts many teachers when one of their students is diagnosed with a chronic illness and consequently misses an extended period of schooling. Although in their private lives most teachers use digital technologies for social networking and other internet-related activities, they do not appear able to adapt the affordances of these online technologies to make teaching and learning more engaging and effective for themselves and their students. The use of terms such as *digital native* (Prensky, 2001) to describe young adults, including new teachers, is inaccurate because they are not dependent on technology, especially in the work and study that constitute the major activity in their life. For new teachers a normal day would consist of at least eight hours at school, then time spent travelling, eating, sleeping, and finally socialising personally or electronically if there is any time left.

The *Link 'n Learn* research project has been outlined in an earlier section of this paper. Kev was a student participants *Link 'n Learn*, and while his story has been reported elsewhere (Jones, 2011), it is a good example of how teachers and schools can overcome issues when they make the welfare of the student their prime focus. Kev spent Wednesdays at the RCH having treatment for a chronic illness, forcing him to miss two English classes. His English teacher Tina was not only part-time at Kev's school, but she had never used ICT in her teaching. In the end Tina overcame her dislike of technology with some very directed assistance from the school and the Education Institute.

At the start of a school term, Kev began connecting to Tina and the English classes using a Web-based video conferencing application. Kev's laptop was on loan from the Education Institute who also provided access to the Web-based software and a radio microphone for Tina. Teachers in government schools are provided with a laptop computer. Initially, Tina tried using the camera and microphone built into the laptop, but this was unsuccessful because if she moved around the room Kev could not see or hear her. When this was discussed at a meeting with the school welfare Officer, the head of ICT and a representative of the Education Institute, it was decided to acquire a radio microphone and to time-table an assistant teacher with Tina for the two Wednesday English lessons. The assistant teacher was trained to move the camera to follow Tina, and also to respond to any questions or comments Kev made via the messaging section of the software.

For the final two terms of the school year this system continued to be an effective means of communication and teaching in an online environment. It resulted in Kev satisfactorily passing the subject and being able to continue his schooling the following year. All of this was only possible because the teachers concerned sought and found solutions to issues relating to teaching and learning in an online environment, how to enable an absent student to be

both a member of the class and special case, and how to adapt to new technology that they had not used before.

Case Study 2: Online assessment project.

Australian students, teachers and education systems have increasing access to digital technologies. However surveys of technology use in primary school classrooms reveal that students spend very little learning time using this technology. Working in a medium sized government primary school, this research project aimed to investigate the perceived and actual differences of students between paper-based and computer-based testing. In the first phase that is being reported on here, grades 4 and 6 students took two mathematics tests, one paper-based and the other online. Both tests have been developed by the Australian Council for Educational Research (ACER) and are claimed to be normatively equivalent.

Almost all assessment of Australian school students is paper based. However there are computer-based or online tests available to teachers. The participants in this study had used some forms of online testing available to government schools. In addition to the results from the ACER tests, data was collected through informal focus group discussions with students and unstructured interviews with the class teachers of the students.

A number of surprising and disturbing results were obtained, and these are a source of some of the issues raised in this paper. Perhaps the most significant result was the poor perceptions and beliefs expressed by both students and teachers toward the relevance in meaningfulness of online testing. These perceptions could be summarised as the existence of a dichotomy – paper-based tests were real and important while online tests were like a game and were therefore not important. Student results from the two modes of testing were disparate. It also appeared that only the results from the paper-based test bore any correlation to results from the 2010 national testing (NAPLAN) that these students had undertaken. As a follow up, some weeks later the students re-took the computer-based test, but this time in a paper-based format.

Students were video-recorded while undertaking the online tests and two surprising observations came from the analysis of this data. First, very few students made any attempt to use the paper and pen provided for calculating or sketching, unlike what was observed when the tests were paper based. The second surprise related to the behaviour of teachers when they supervised an online test. Even though each teacher turned the video camera on when their students were ready to start the online test, there is evidence of teachers allowing students to talk, to look at another student's screen, or even for the teacher to provide assistance to a student.

A new form of assessment. At this primary school the participating teachers were either in their forties or were younger. They had government supplied laptop computers, and taught in classrooms with up to six desktop computers for student use, and all were expected to plan and teach at least one lesson each week in a school computer room. While the teachers might not have been technology wizards, all had attended several ICT professional development

courses and were believed (by the school leadership team) to be capable of conducting lessons that involved using ICT to assist student learning.

The school is located in a low socio economic area that has a large migrant population. In addition, almost all families work very hard trying to pay off a house mortgage and settle into an acceptable lifestyle. Not surprisingly very few students in the research project had a personal computer at home, although in excess of 80% reported that they had shared access to a home computer. As noted above, all students at the school were expected to use computers in their classroom and in the school computer room.

In summary, both the teachers and the students in the online assessment research project had some ICT knowledge and skills. Additionally all were used to the requirements of formal testing and assessment, and respectively regularly supervise or undertake computer-based and paper-based forms of assessment. However the research data demonstrated that both teachers and students behaved in unusual and unacceptable ways during online testing.

Data collected from the interviews and discussions following the online testing clearly indicated that both teachers and students perceived a significant difference between paper-based and computer-based assessment. There was general agreement that paper-based assessments were “serious” and required a specific set of behaviours. However computer-based assessments appeared different, and students in all six classes involved in the project perceived this mode as being similar to playing a computer game.

Discussion of Issues Identified

Three issues that both experienced and beginning teachers reported as being root causes of problems with using and integrating ICT into teaching are:

- These teachers did not learn with ICT when they were school students.
- Pre-service teacher courses focus on techniques for teaching whole classes in face-to-face mode, and never on teaching individuals online.
- Educational hardware and software available is continually changing.

When busy classroom teachers were asked to take on the additional burden of using digital communications technology to teach in an online mode for a student who was absent for an extended period, the second of these issues caused many problems. Other teachers, who had never taken an online test as a student or a teacher, were observed demonstrating very different approaches when they supervised students undertaking online and paper-based assessment tasks. These and other examples are discussed in more detail in the following sections, and implications for both teachers and students are explored.

Issue One: No Experience as a Learner with Technology

Although computers have been used in classrooms and other educational settings for more than three decades, data collected from teacher interviews in the two projects referred here indicates that many current classroom teachers have little if any personal experience of learning with ICT. Even teachers

currently in initial teacher education courses report that while they used computers in their secondary schooling, they have difficulty categorising any of it as being educational.

This lack of personal experience in learning with ICT appears to be partly a consequence of a lack of computers in the secondary classrooms of five years or more in the past. All teachers interviewed remember their school having a computer lab or room, but also recollect that typically they were timetabled into it on a weekly or fortnightly basis. They have few memories about what they did with computers apart from playing games.

Prior to the general introduction of wireless networks and laptops or netbooks into schools, it was difficult for teachers to create lessons that enabled every student to learn with the assistance of digital technologies when it is most appropriate.

Issue Two: Teachers Are Trained to Teach Classes

Initial teacher education courses focus on teaching a class or group of students, as this is the most common occurrence in schools. Little or no attention is given preparing new teachers to teach in one-on-one context, with or without technology. Beginning teachers might be introduced to the idea of have several groups within a class, but not of working with an individual learner.

Similarly, because of traditional school practice, new teachers are not taught how to teach in online environments. Many providers of initial teacher education offer some form of online learning, but it does not seem to be related in any way to teaching online. The focus is completely on face-to-face teaching and learning.

Issue Three: Technology Is Constantly Changing

While this is inevitable and has become a fact of life in the twenty-first century, new technology can confuse users. The development of Web 2.0, and more recently of Web 3.0, has resulted in teachers having again to rethink and re-adjust their pedagogy and classroom practice. Currently many education systems work on a three-year changeover for teacher and student computers. While educational hardware might remain more or less constant for three years, this is not the case for educational software.

It appears that not all education systems are able to provide appropriate ongoing teacher development in ICT that keeps teachers abreast of current developments. One possible solution is to control the introduction of new hardware and software into a school system, however this is not acceptable to parents, students, and many teachers.

Even though many teachers use a variety of social media as part of their daily personal life, this use does not automatically translate into classroom protocols and practices. For example, using software such as Skype to communicate with family and friends does not necessarily assist teachers to teach online using video conferencing hardware and software.

Conclusion

Although participants in the studies reported on here were located in Australia, it is likely that similar results could come almost any developed country. Computer access and use at home and at secondary school would vary across and within countries, but such differences are not crucial to the focus of this report. The students who were surveyed in this study had a high level of access to computers and the Internet, however they were uncertain how to translate their personal ICT knowledge and skills into something that would be applicable and useful in elementary school classrooms.

Findings from the two research projects discussed in this paper show several shortcomings in current initial teacher education as well as in professional development for practicing teachers. It appears that a majority of teachers did not experience learning with ICT when they were students, and they struggle to determine how best to teach with the technology. In addition there is a predominant focus on whole class teaching in teacher education courses, and this can cause problems in coping with small groups with special needs, including gifted and talented students, and students who are absent for extended periods from school.

Teachers at all levels of education from pre-school to tertiary will continue to be expected to make increased use of computers and other learning technologies. For beginning teachers the focus has shifted away from concerns about access to technology and the acquisition of skills towards the lack of example being shown by some experienced classroom teachers and teacher educators.

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