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Technology Together: Supporting whole-schools to become capable learning communities.

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Abstract

While many teachers are integrating information and communication technology (ICT) in their teaching practice, there are still a significant number of teachers who are hesitant, reluctant or resistant to using technology, either personally and/or in their teaching. Many teachers remain daunted by the rapid rate of technological change, and the inability to feel as though they 'know enough'. While most approaches to teacher professional development concentrate on skill development of individual teachers, this paper describes an approach that focuses instead on the values, attitudes, beliefs, confidence and learning strategies of teachers, and on building a culture within a school that supports ICT capability, not just competency. Technology Together is currently being developed collaboratively by Southern Cross University and the Catholic Education Office, Lismore, funded by the Australian Research Council (ARC). This paper presents initial findings, which indicate that the approach can have significant outcomes for schools, not only in relation to ICT learning and integration, but in building a whole-school learning community which fosters collaborative and supportive partnerships between school leaders, teachers and students.

INTRODUCTION

Professional development for teachers in ICT is currently a major financial and strategic issue for government and non-government schools, both nationally and internationally. Significant inroads have been made in many schools, and integration of ICT is now becoming an assumed responsibility of all teachers. There is, however, still great diversity in ICT skills and confidence of teachers across most schools, and while there are those teachers who are innovative and creative, many teachers remain hesitant and minimalist in their use of ICT, or avoid it altogether.

Many school systems have implemented ICT professional development initiatives to meet teachers' immediate needs. For the most part such programs focus on providing skills and knowledge to individual teachers, usually those who volunteer. Often those most in need do not get involved due to low motivation, perceived usefulness, high anxiety or resistance to change. Where such professional development is provided in a more compulsory sense, attitudinal resistance can get in the way of effective learning and significantly impede implementation back in the classroom.

Another major challenge for individual teachers and schools lies in the fact that technology evolves so rapidly. Directive training in specific technologies can become inadequate and out-of-date in a very short period of time (Melczarek, 2000). Teachers often encounter problems, challenges and differences in implementation in their classroom, issues that training hasn't prepared them for, and poor retention of learning from training sessions (Bjork, 1994) can also lead to lowering of computer self-efficacy and minimal impact on classroom practice. For some learners, such training sessions

reinforce learning dependency rather than independence and highlight distinctions between adept and novice computer users, further diminishing the self-efficacy of more reticent computer users.

The approach to teacher professional development in ICT described in this paper provides an alternative to directive, skills-based training. Rather, this approach argues that teachers need to be engaged in continual, life-long learning in order to maintain and progress their skills and knowledge and to be flexible and responsiveness to technology change. *Technology Together*, as described in this paper, is based on research (Phelps & Ellis, 2002a, 2002b; Phelps, Ellis & Hase, 2001; Phelps, Graham & Kerr, 2004; Phelps, Graham & Thornton, 2006) that indicates that effective ICT professional development requires changes in attitude, values and beliefs that develop confidence for ongoing learning and the right attitude to change. It also requires attention to the cultural and structural issues that either facilitate or limit effective learning by teachers.

In short, effective professional development for teachers in ICT should explicitly build communities of learners; teachers, school leaders and students who are motivated and engaged to support each other on a lifelong ICT learning journey. Professional development must move beyond teaching skills to building capability and capacity (UNESCO, 2002) and this involves challenging teachers to see themselves as learners, and supporting them to adopt attitudes, values and beliefs and appropriate learning strategies to support this ongoing learning.

> With ICTs, students often become teachers, using the processes of peer tutoring or reciprocal mentoring. Indeed, a teacher may facilitate learning by reversing the teaching-learning roles, with students acting as expert learners who model the learning process…Teachers need encouragement to adopt such strategies rather than to feel ashamed to be taught by young learners (UNESCO, 2002).

WHY FOCUS ON WHOLE-SCHOOL CULTURE?

Technology has and is bringing with it significant change for schools. How this change is viewed and approached is very much influenced by school culture, defined here as the norms, values, beliefs, traditions and rituals that build up over time as people work together, solve problems, and confront challenges and which shape how people think, feel and act in schools (Howard, 1999).

School culture has a significant impact on school improvement and school change. As Fullen (1991) has indicated, technology integration in particular represents a shift in values in our views of teaching and learning, and raising awareness of this conflict is not only necessary but also a fundamental component to successful change.

Change, and in particular change associated with ICT integration, is not easy and simplistic approaches do not work (Howard, 1999). For teachers to effectively integrate ICT in learning and teaching the culture of their school needs to be supportive, not only in resourcing technology access, but in encouraging teachers to continually learn and experiment with changes in pedagogy. Previous research (Phelps, Graham & Kerr, 2004) into factors impacting on learners' approaches to ICT indicates that teachers need to be encouraged, but not pressured, supported but not over-assisted, stimulated with ideas to enhance perceived usefulness and adequately resourced without forming an impression that resources alone will lead to effective ICT integration. Such changes take time, willingness to learn and on-going support, and there are 'no quick fixes'.

Much research emphasises the importance of computer self-efficacy in influencing teachers' willingness to use technology (for example, Albion, 1999; Compeau, Higgins & Huff, 1999; Igbaria & Iivari, 1995; Milbrath & Kinzie, 2000). However, just as individual teachers can develop values, attitudes and beliefs about their computer use, so too can a whole school culture develop collective values, attitudes and beliefs that impact on computer use. The notion of collective efficacy (Goddard,

Hoy & Hoy, 2004) provides further justification for teacher professional learning being approached from a whole-school perspective.

Technology Together has been developed with an explicit acknowledgement of the complexity of factors that influence ICT integration in schools. It acknowledges that there are no single, linear or fail safe approaches and that not everything can be pre-planned. Rather, the approach builds on the notion that reflective school communities can be supported to more readily embrace learning opportunities as they arise and the approach focuses on changing the school culture to one where ICT is actively valued, embraced and discussed amongst staff.

BACKGROUND TO THE RESEARCH

Technology Together has its early foundations in a course that was developed for pre-service and practising teachers at Southern Cross University (Phelps, 2002; Phelps & Ellis, 2002a, 2003). We faced the challenge of preparing students with very diverse ICT backgrounds for a career of continued technological change. Our hunch was that the best way of helping teachers to survive and thrive in this context was for them to develop confidence and effective learning strategies. Through a series of action research cycles, conducted over several years, a metacognitive approach to computer learning was developed, evaluated and refined (Phelps & Ellis, 2002a, 2002b; Phelps, Ellis & Hase, 2001).

The approach was seen as beneficial by the Catholic Education Office, Lismore, which entered into a partnership with Southern Cross University to provide accredited postgraduate-level professional development to teachers in primary and secondary schools, using the model. After an initial pilot of the course with forty teachers (Phelps, Graham & Kerr, 2004), a further 200 teachers participated. However, not all teachers want to do formal courses and the teachers who were most in need of, and most likely to benefit from, the approach weren't necessarily the ones that volunteered. We also recognised that providing professional development that focused on individual teachers was only addressing part of a very complex web of factors impacting on teachers' ICT integration. We felt that the metacognitive approach might productively be adapted to a whole-school implementation model.

In 2003, the Catholic Education Office, Lismore and Southern Cross University applied to the Australian Research Council (ARC) under the industry linkages program. This application was successful and in 2004 the *Technology Together* research project began. The first cycle of the research occurred in 2005 with seven schools participating (6 primary, 1 secondary). A whole-school approach was developed and refined as we collaboratively learnt what worked and what didn't. In 2006 a further nine schools are participating (8 primary, 1 secondary), trialing the approach developed in the first cycle and refining it further. The intention is to produce a professional development process, which has been developed and tested in practice and is supported by a set of resources, for use in other schools.

THE RESEARCH AND DEVELOPMENT APPROACH

As mentioned above, *Technology Together* has been developed through an action research process, intended to produce both change and improvement (action) and new understanding (research) (Kemmis & McTaggart, 1988). A school analysis was conducted with each participating school at the beginning of the year to document aspects of school history, current culture and context. Data was also collected from all teachers to ascertain their values, attitudes and beliefs, skills and use of computer technology. This survey was repeated at the end of the year. Throughout the year, qualitative data were collected, with school leaders and key teachers acting as co-researchers. Data were in the form of narrative accounts of key incidents, gained through participant observation, reflective journals, notes from meetings and samples of work and in one school's case, video interviews with teachers (see also Phelps, Graham, Brennan & Carrigan, 2006). Throughout the cycle there were also opportunities for the mentors to communicate, and hence share experiences, with each other electronically, including both asynchronous (using Moodle) and synchronous (using GroupWise Messenger) communication.

At the end of the year each school wrote an evaluative report on what had occurred in the school, what had impacted on and supported activities (critical success factors) and recommendations for change to the process.

SO WHAT IS *TECHNOLOGY TOGETHER*?

Technology Together is a holistic and flexible approach to ICT professional development for primary and secondary school teachers. It is not just about ICT skills training, but rather, acknowledges the importance of school culture and of meeting individual teachers where they are at on the technology learning ladder. *Technology Together* is about developing teachers' capability – their ability to go on learning and adapting to technological change rather than just their computer competence – their ability to perform set skills.

In its current format, *Technology Together* is implemented by schools over 3 school terms, although in the longer term our expectation is (and initial data would suggest) that the *Technology Together* process can become an integral component of the school culture. In this way *Technology Together* is seen as a *process* not a *project*. It isn't a 'quick fix' or short-term solution, although it can have immediate and observable outcomes. Rather, *Technology Together i*s about school change and ongoing learning. It is driven by schools themselves and aims to empower teachers to take control of their own professional learning.

The *Technology Together* resources that have been developed thus far (and are being trialled in 2006) guide a school through a process of planning and implementing a goal setting and mentoring process within the school. They also provide a range of strategies for building whole-school engagement of teachers in reflecting on, and discussing, their own learning. These metacognitive foundations (Phelps & Ellis, 2002b; Phelps, Graham, Brennan & Carrigan, 2006; Phelps, Graham & Thornton, 2006) are key to the approach and it is this process that is most powerful in prompting school culture change, and building an ICT learning community.

Technology Together works within a framework of staff within a school supporting each others' learning, rather than a model of 'outsiders' coming in. *Technology Together* extends the concept of mentoring beyond traditional notions of transfer of knowledge from a senior to junior member of staff (Baker, 2002) to a view of mentoring as companionship; where teachers of equal or similar skills or knowledge provide motivation, support and build self confidence. Mentoring is also seen as a means of building school community and collegiality. While mentoring in ICT learning is not new, in *Technology Together* mentoring occurs within a context of reflecting on learning strategies (the metacognitive approach). In this sense, *how* teachers learn is just as important as *what* they learn.

For this reason the *Technology Together* process is based around two components:

- **Initiatives**: Part of the *Technology Together* process is to engage in goal setting, either as a whole-school, or with individual staff. It doesn't matter what initiatives schools take on, the process encourages all teachers to challenge themselves. Some teachers undertake one year-long initiative while others embrace a series of smaller initiatives, one per term. Initiatives might range from gaining confidence with e-mailing skills to using specific software e.g. Kahootz, or Inspiration; digital artwork exhibitions; e-story competitions; or using interactive whiteboards.

- **Strategies**: The strategies which individual teachers and schools implement are underpinned by the metacognitive approach. At a school level *Technology Together* might involve regular informal discussions with teachers at staff meetings; weekly or fortnightly meetings or similar small-group processes; and time for sharing or celebration across the school. At an individual level, teachers are encouraged to develop strategies of exploratory learning, problem solving and appropriate help seeking within a context of collaborative and self-directed learning.

Most importantly, the approach is highly flexible and explicitly adapts to varying school cultures. What remains consistent across the schools is the strong focus on teachers actively directing their own learning, that the whole-school community is reflecting on and sharing their experiences through the metacognitive framework and that the school is explicitly encouraging, supporting and celebrating teachers' learning.

CAN *TECHNOLOGY TOGETHER* BUILD CAPABLE LEARNING COMMUNITIES?

While it is beyond the scope of this paper to present the diverse findings from this research and development initiative, a particular focus is placed in this section on presenting data related to the potential of *Technology Together* in building the capacity of schools as learning communities.

Data in this section are drawn from the final reports from the seven schools involved in 2005. These were examined with a view to identifying evidence of changes to the nature of the whole-school community, and themes associated with this.

Evidence would suggest that *Technology Together* does have potential for motivating teachers to embrace ICT integration. One school reported that teachers had 'moved from identifying ICT learning as something which occurred in the computer laboratory for one hour a week and separate to classroom practice, to an integrated ICT approach within the classroom'. *Technology Together* was also identified as promoting a positive attitude to ICT**.** For instance, one school noted that 'teachers are regularly experimenting with, and effectively using, ICT initiatives in the classroom. Generally speaking there is a more positive, open attitude towards ICT and the potential it offers'. The process was also identified as motivating teachers to experiment and try new things, to be curious and to seek out learning opportunities:

> *Technology Together* has provided a springboard for future development in technology. Teachers and support staff are continuing to ask each other questions such as: "How did you do that?"; "Can you show me?"; "How can I integrate best using the computers in the Library?"; "I saw that your class did ….. I'd like to try that" (*Technology Together* Mentor, 2005).

This increase in dialogue played a significant role in changing school culture. For instance, one school reported that 'ICT enjoys a much higher profile and discussion surrounding it is common place. Teachers regularly share and discuss new and exciting educational websites, software and hardware, plus the challenges and opportunities that these present'. In this sense, *Technology Together* has the capacity to increase teachers' confidence and willingness to learn.

> Teachers became more self-reliant and as the year progressed, they asked fewer questions of Companion Mentors. Rather than indicating a waning of interest… this demonstrated teachers growth in knowledge, willingness to persevere and problem solve independently and greater networking among staff in general. This demonstrates teachers identifying themselves as lifelong computer learners (*Technology Together* Mentor, 2005).

Such changes in approaches to learning weren't, however, limited to ICT. As one school recounted, '…some teachers changed the way they view many things about school. With increased confidence they were able to look at most problems around the school with an attitude of "I know there is a solution" rather than "I give up"'. This sense of a community of learners across a whole-school was evident in most of the schools involved. As another school indicated, 'more staff members are suggesting strategies to others to help solve their problems… Teachers do not feel isolated - there is always someone to talk to regarding ICT issues'. School leaders also played an important role in the process and in instances this significantly enhanced their relationships with teachers. 'The opportunity to work with a broad range of staff in a professional yet non threatening situation has resulted in a

greater awareness of where people are at, the needs of the community and how best they can support staff in an active and vital manner'.

Several of the school reports indicated that involvement in *Technology Together* challenged teachers' attitude to professional learning more generally.

> Participation in *Technology Together* has led to a cultural change in our school. The executive teachers have previously been hesitant at implementing some professional development because experience has shown that it was rarely accepted as important and often met resistance. This project has provided the platform to approach other whole school development opportunities with enthusiasm and a sense of collegial growth (*Technology Together* Mentor, 2005).

Perhaps most notable was evidence that *Technology Together* changed teachers' relationships with their students. By engaging teachers in reflecting on, and challenging their expectations about their own ICT learning, and the need (or even the ability) to 'know everything' before trying something with their class *Technology Together* led many teachers to become side-by-side learners with their students. One school, for instance, reported that 'staff members recognise that students are often highly skilled in ICT practice and keen to share their knowledge with teachers. This is a highly significant shift in the perception of good teaching practice at our school'. Another wrote that 'teachers are now willing to explore different models of teaching... Being initially reticent at being a co-learner with the students or even having the students teach the teacher has been replaced with excitement in exploring ways in which both student and teacher can learn together'.

THE BEGINNING OF AN ONGOING STORY

Much was learnt from the involvement of seven schools involved in 2005 and in 2006 a more refined approach is being tested. Learning from cycle one has led to the production of a strong support resource (five booklets and three journal templates for use across three terms – these are showcased through our conference poster). These resources together with the workshop that was held at the beginning of the 2006 year explain, lead, guide and facilitate schools in adopting *Technology Together* and include suggested strategies for mentors and a comprehensive scaffold to support teacher goal setting. The very nature of action research means that *Technology Together* will continue to evolve as we learn more about the influence of school culture on ICT learning and professional development. However we are confident that *Technology Together* can provide significant outcomes for schools, not only in relation to ICT integration, but in building a community of confident ICT learners and in fostering relationships between school leaders, teachers and students, which support stronger partnerships for ongoing ICT learning. *Technology Together* can develop a culture within a school that is supportive of teachers' professional learning; one where dialogue between teachers is increased and teachers come together to support each other. It can help teachers come to terms with the constant and rapid rate of technological change and encourage all teachers to accept and embrace this change and become independent and confident ICT learners.

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