Rethinking professional learning programs to produce technology proficient educators for 21st century schools

ABSTRACT

This paper reports on findings from two action research projects in Australian schools focussing on the provision of professional learning to support the use of Information and Communication Technology (ICT) in teaching and learning. For the purposes of comparative analysis, as well as school circumstances, different models of professional learning were used in the two schools. Both models supported teachers in their confidence and use of ICT and the findings illustrate that where teachers are given more time to experiment with ICT, there is a greater likelihood of the learning activity being richer and more authentic for students. The projects clearly highlight what research has been saying for some time; there needs to be a shift in how schools approach continuing professional development (CPD) for teachers. It is clear the industrial model of teacher training is no longer relevant in the information age. Some rethinking in approach needs to occur at individual school leadership and system level, if school organisations are to seriously address how teachers become technology proficient educators. This paper discusses two models of how this might be achieved.

INTRODUCTION

The start of the twenty-first century finds education and technology at the crossroads. Schools are having difficulty keeping pace with the rapid changes that information and communication technology (ICT) is bringing. Knowing which path to travel is posing quite a problem for school leaders. The last few years have seen professional development for teachers in the use of ICT slowly becoming a vital ingredient for schools. It seems as though the rapid implementation of technology has forced schools to address the issue of teacher professional development. Whether this is the order it should have been is a matter of debate. Some would argue, it is a case of putting the cart before the horse, or in this instance, the computer before the training in the use of the technology. The huge investment that school organisations are making in computer networks and hardware demand a rethink of priorities when it comes to professional learning programs. It is very apparent from the research presented here that schools cannot continue in the way they have. ICT is demanding that schools expand commitment to their investment in human capital - the teachers, if dividends are to pay off for the ultimate beneficiaries of technology rich learning environments - the students.

BACKGROUND

The study focuses on two different models of professional learning that supports teachers in the use of ICT in their learning and teaching. The action research projects took place in two schools in Sydney over two terms in mid 2005. The study set out to investigate which models of professional learning better suited busy teachers in school settings and then compare and contrast the findings. The focus question for the research was: 'How should teachers best develop themselves to become technology proficient educators for the 21st Century?'

PURPOSE

The purpose of the study was to discover:
1. What insights can be gained from ***current research*** into ICT teacher training models, that are being shown to have positive results for teachers?
2. What do ***classroom teachers say*** about the conditions under which they best learn technology, and how does this assist them integrating ICT into their teaching?
3. What ***changes are needed*** to schools' existing structures, and processes, and how will they impact on ICT professional learning programs in schools?

CONTEXT FOR TEACHER PROFESSIONAL LEARNING IN ICT

It is widely reported nationally how the increasing availability of ICT presents teachers with exciting opportunities to transform pedagogical practices (Fitzallen, 2001; Newhouse et al, 2001; McCrae et al, 2001; Downes et al, 2001). Leading international projects such as the Apple Classroom of Tomorrow (ACOT) studies in the United States, and the British Educational Communications and Technology Agency (BECTA) report on ICT and pedagogy, suggest that if transformation is to occur in the delivery of ICT in the classroom, then it must first occur with teachers' professional learning. Larry Cuban also points to the ACOT studies, that highlighted the crucial importance of school site based professional development (in Sandholtz et al, 1997). The BECTA report says, '…further substantial support for continuing professional development is necessary in order that teachers integrate the use of ICT and improve pupils' attainment' (Cox et al., 2004, in Webb et al, 2004).

RESEARCH METHODOLOGY

It is widely agreed that multiple research methods are useful in achieving greater understanding, (Trinidad et al, 2002) so a range of both qualitative and quantitative research methods were employed during the study. These included:

- Surveys of the teachers (20) the author worked with in two schools (referred to as School A and School B);
- Semi-structured interviews with teachers at middle management and senior executive level in both schools;
- Survey of sample of teachers (10) from a third Catholic school;
- Observation of teachers and students in the classrooms;
- Examination of student work samples.

CASE STUDIES

School A is a Year 5-12 boys school located on the Northern Beaches of Sydney. The author worked with teachers in the Middle School (Years 5-6) over two terms, two days a week as a Education Technology Consultant. There were nine classroom teachers involved plus the Middle School Curriculum Coordinator who met with the author to discuss the overview of the project. Each teacher was given two periods release a cycle (ten days), to work one on one with the author, developing their ICT skills, and working towards an integrated unit of work, with ICT embedded into their classroom activities.

All teachers undertook an ICT skills audit at the start of the project, to measure their individual skills against fifteen broad ICT competencies, to determine a snapshot of their current skill level. The survey showed that across the fifteen competencies, the majority did not possess the skills or the confidence to use technology consistently in their learning and teaching. The principal said early on, "We have all the gear (referring to significant investment in computers), but no idea" (teachers skills and confidence). This confirms the point outlined at the beginning of this paper, of schools investing considerably in computer hardware and later considering professional learning programs for teachers. To his credit, the principal had the vision to recognise this and had started contributing significantly to PD for his staff, to assist them make a shift in their teaching.

Term two began with a focus on building each teacher's skill set, in areas where they scored less than two (scale out of five), across the fifteen competencies. For the three teachers who had scored above average in the audit, it provided the time to focus on an area of ICT that they wished to develop or enhance. For two teachers this was using digital video in the classroom, and the third teacher expressed a desire to focus on integrating technology with Howard Gardner's Multiple Intelligences model, and Bloom's taxonomy. The other six teachers developed their basic skills in communication and use of email, presentation, concept mapping, and researching the best of the internet.

A key part of the professional learning model was that each teacher had one to one mentoring, where they could move as fast or as slow as the needs of each teacher required. The other critical feature of this model of learning was, teachers were given time by the school to develop confidence in areas they wished to pursue. There was no predetermined path for the training. The only real goal was to provide time, and an ongoing and supportive situation, in which teachers could experiment with technology, and develop their confidence and skills. Additionally, learning took place in a curriculum context, so the teachers would have resources to use in the classroom, when they had finished. Each teacher moved in directions they wanted to go, and I believe, this gave them a lot of control over their learning, throughout the duration of the course.

As teachers developed their competence in use of basic ICT skills, the focus shifted, to planning, and implementing a unit of work, with technology embedded into the class activity. Teachers progressed through learning how to plan a unit of work, develop the research questions, and examine where to use ICT in the unit. Those who were keen, and progressing well saw, this as a good opportunity to do some substantial forward lesson planning, to be implemented the following term. For those teachers, who were not ready for this and were not moving as quickly as others, the focus shifted to planning for term four. Again, the flexibility of the program and the one to one nature, gave each teacher the room to move, at their own speed.

The start of term three, saw a continuation of the time release commitment of two periods being given to each teacher, but emphasis of learning shifted from one to one learning to implementation of the activities in the classroom, with the students. Planning time in the previous term, enabled access to computers to be booked well in advance. The author modelled, and led some activities in the classroom, and this gave teachers I believe, a more authentic learning context. Teachers could see, how the activity they had

planned and developed the previous term, was now being used with their students in the classroom. They had the confidence of knowing, they had support in the classroom, for any questions or problems that arose, while also being able to assist students as they moved around the room. Out of the nine teachers, the author worked with, six were actively using technology in the classroom with their students, in term three. Of the six teachers, the author worked closely with three in the classroom modelling instruction. Only three teachers were not ready to implement activities and their goals shifted to planning for term four.

School B is a girls' K-12 school, on the lower north shore of Sydney. The author worked as an ICT Integrator, across two school terms, two days a week, with nine teachers from Years K-6. Each of the teachers was allocated, one timetabled lesson a week in a computer lab context. Outside of this time students had access to a bank of twenty computers, in close proximity to their classrooms, that they could share with other students in the Junior School.

The school had spent considerable time in working their Junior School programs to integrate different learning theories and ICT, but little time on developing the activities that flowed from the technology, nor the time required to demonstrate classroom use of the new technologies to the teachers. The school valued the importance of student access to regular use of computers, hence the weekly timetabled period, but their structures worked against more regular use of technology. The role of the author was to fill some of the gaps.

Some limited time, was initially given to planning the various units of work, and activities that would be integrated with each class. Once this was done, the author modelled the use of technology in the lab with the teacher. As most had minimal confidence or little opportunity to develop this confidence with the use of technology, the author modelled the lesson and the teacher observed and assisted with students. Whilst different to the professional learning model in School A, this nevertheless allowed teachers to slowly become more familiar with technology, and various software programs being used with the students, whilst at the same time enjoying a similar level of support to teachers in School A.

Some teachers from School B, after watching a unit develop, and seeing the lessons modelled, felt confident to demonstrate some activities to the students. This meant demonstrating via a ceiling mounted data projector to the class. At times, little, unexpected problems occurred (software glitches), that tested the confidence of the teacher, but with support from the author, persisted, and I believe, this helped alleviate some fears they had, and built their confidence.

As the unit of work progressed across the term, new ICT skills were added each lesson. As planning got better, the author encouraged the teachers to go and test the software, experiment with it, and build an activity that they could add to the demonstration, for the following week. The more time they spent on little tasks like this, the better their skills and confidence became. Having someone provide dedicated ICT curriculum support enabled teachers going on excursions to take digital video cameras and explore further usages of ICT outside the formal classroom setting. Without this person, I believe, teachers would have been more reluctant to try such activities, because of their perceptions around the difficulty of using technology, as well as the lack of support that many felt. When the support was provided, teachers' confidence, and willingness to experiment with technology, went up noticeably.

Both models supported teachers, in helping them develop confidence, and skills to use technology, in their classroom practice with their students. Having another teacher to talk with, ask questions, watch in action, and essentially learn from a peer mentor, was helpful. The big difference between the two models, was the time provided to plan to use ICT. School A had built into its model, a small (two hours a fortnight), but ongoing commitment, to providing time release for its teachers. This allowed time for teachers, to be introduced to new models of teaching, search for resources, play with software, and build a

connection, to using ICT in an integrated unit of work in the classroom. Basically, as leading educational researcher Roy Pea considered nearly twenty years ago (1987), 'it gave these teachers a critical amount of time to re-examine their pedagogy to make the most of ICT's' (in Elliot, 2005: p.8). School B did not have this planning time, and relied more on the relationship, and collaborative environment that developed between the author and teacher in the classroom.

SURVEY OF FINDINGS

Impact of ICT

Whilst 73% of teachers agreed ICT has impacted on their teaching, 80% on average, spent between one to five hours a week, using technology in the classroom. 60% agreed, they liked the challenge of exploring new software, and discovering its possibilities. Despite popular opinion, only 13% of teachers surveyed, did not feel confident with their general ICT skills in the classroom, and 73% agreed they had a clear sense of direction, in how to use ICT to enhance the learning for students.

Positive Influences and Limiting Factors

86% of teachers, said access to computers was the most significant factor, that supports their use of technology with students. 60% agreed, that support in the classroom, and time given for professional development opportunities, was next highest in priority. Usual discussion that centres on outdated hardware and lack of
technical support did not feature highly. This was probably due to the fact, that both schools had excellent IT resources, and infrastructure, as well as adequate technical support on hand, a feature which would not be typical, in many government, and systemic schools.

Time

It was generally agreed, the time that was provided to teachers from School A, greatly assisted the classroom activities that were developed for the students. It was time to research, build questions, trial ideas, and experiment with software. It was time to build confidence, and skills, teachers in School B, did not have. One teacher from School B commented, "I don't like learning on the run in front of students". I believe the activities developed with teachers from School A, were better planned, and provided a richer source of learning for the students. One teacher from School A, originally booked six lessons in the computer lab, for students to complete the activity, but as students started building their assessment task, the teacher allocated more computer time in the lab, because of the quality of work the students were presenting, as well as the interest, and enthusiasm, the students were displaying. The teacher said at the end, "The activity really engaged the boys. They loved discovering new facts and adding them to their presentation".

Learning and Teaching

73% of teachers agreed, that student use of ICT, has the capacity to provide valuable resources, and tools, to support teaching, whereas only 38%, could relate to ICT, strongly supporting a student-centred, inquiry based model of learning. Most saw ICT, as a useful resource for students, with only one teacher agreeing, it had a major impact on how students learn. One teacher said, "team teaching is great…..it helps me learn as well as the students". This seems to confirm numerous studies, that point to the use of technology mentors, as a valuable resource in planning staff development for technology integration (Breithaupt, 1998; Sherwood, 1999). Bringing ICT curriculum expertise into the classroom domain, it appears from the research, has rich learning rewards for both teachers and students.

REFLECTIONS

The study highlighted the fact, that all teachers involved benefited from the dedicated time, and support, in one way or another. The aim of the projects, was to give teachers increased time, and support, to develop their skills, and confidence, with the use of ICT in the classroom. All surveyed, felt this was achieved to some degree. School A allocated more planning time to this aspect of the professional learning program, and this appeared to be the single biggest difference between the two schools, in the end. Teachers in School B, had the support of an experienced teacher to lead lessons in the computer labs, and to provide expert advice to students; this helped them see how ICT could be utilised in the future.

Mentoring

As teachers began to feel more comfortable working with a mentor teacher, some felt more confident discussing their ideas, on how to use, and incorporate technology, into their programs. Discussion moved away from the teachers needs to focus on the curriculum units, and what the students were achieving. One teacher said, "one to one guidance helped stimulate my lesson planning". Another said of the teacher mentor approach, "it helped provide continual feedback on the progress of programs in place". The observations, and comments from teachers involved, seemed to highlight the fact, that when they had time allocated, to work with another teacher, one to one, either in skills based, or curriculum context activities, teachers were gaining confidence in the use of ICT.

Time and Access

All teachers involved said, they spent on average less than two hours a week, using ICT in the classroom. Whilst working with the author, this increased to about an hour a day, throughout the course of a term for School A, because of the planning that had gone into developing the unit of work for the students, and the time they would require to complete the activity by the end of term. School B was more inflexible with lab bookings, because they shared these facilities
with senior classes, who also had permanent bookings. This raises the issue of student and teacher access to computers. How do large numbers of students, get constant access to a finite number of school computers, whilst at the same time, controlling equity of access for all teachers, and students?

A dominant theme throughout the projects was the issue of time. How do schools manage to provide teachers with more quality time (not rushed after school classes or learning over breakfast or lunch!) to learn technology, without detracting too much from impacts on students learning? At the end of term three, School B was in the process of installing interactive whiteboards (IWBs), into every classroom in the school, and teachers were receiving a five week crash course in learning how to use them (at lunchtime!). The answer appears to be found in effective leadership and school culture. The research is saying that educational change rests with effective school leaders, determining priorities for individual schools (LeBaron and Collier, 2001).

Leadership

At a school level, this means decisions around keeping teachers in the classroom teaching, increasing funding to provide ICT curriculum support, and providing a well managed and planned ICT professional learning program, where teachers are expected to leave the classroom, to bring back quality resources and ideas, that will enhance their classroom practice. This reiterates the point,

…like all other staff development, success depends on giving teachers time to practice, communicate, and reflect; fostering new vocabulary and habits; setting expectations and accountability'.

(LeBaron and Collier, 2001: p.62).

The fact that both school Principals provided time, and resources, for professional learning and curriculum support, was critical to the success of the project. In both cases, the training seemed to be in direct response to the impending arrival of computer hardware. In the case of School A it took the form of a new Creative Arts and Technology Centre, and for School B it was the IWBs. This reminds us of the 'cart before the horse' scenario, mentioned in the introduction.

CONCLUSION

The results from the two projects, hopefully highlights to educational leaders, the need to continue to assess new, and innovative responses, to implementing school based ICT professional learning programs. Research studies, time and again, point to teacher quality as the single, most important ingredient, to produce enhanced learning outcomes for students. The classroom teachers interviewed, and observed, in the two school projects discussed here, thrived, when given access to ICT professional learning time and support. The model of professional learning implemented is not the critical ingredient for schools. Rather, it is the ongoing support structure that schools put in place, to assist teachers develop their teaching and learning, that is essential. Ultimately, if schools are to produce technology proficient educators, who can foster innovative student learning approaches, then school leaders will need to rethink their priorities, and put in place solutions to address those priorities.

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