Student Learning: The Professional Learning Challenge in the ICT Action Research Project
A Research Paper on the Quality of Professional Learning in the QTP funded ICT Action Research Project

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Abstract

There was a different interaction in the classroom with ‘Inspiration’ to a certain extent. There were certain things that we knew but as soon as you gave it to the kids they all of a sudden discovered other things you could do with it, so they began teaching the other kids and ourselves.

This paper, written immediately after the preparation of case studies of teachers introducing Information and Communications Technology (ICT) into their classroom practices, is concerned to inquire into the way in which teacher professional learning affects classroom practices and student learning. The matter, according to Serpell (2000:) who was arguing within a review of beginning teacher induction, ‘remains elusive’. Case study methodology, as undertaken in this project, has allowed an opening up of the connections between teacher professional development provision, the form of school organisation, culture and interests and teachers’ and students’ classroom practices. The case studies, which informed this paper, present teachers’ perceptions about the impact of ICT on students’ engagement in learning. Whether or not that engagement translates into enhanced learning outcomes for students is a question for further study.

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Introduction

There was a different interaction in the classroom with ‘Inspiration’ to a certain extent. There were certain things that we knew but as soon as you gave it to the kids they all of a
This paper is written as a reflection on the evaluation of a Quality Teacher Program funded project conducted by the Melbourne Catholic Education Office in the period 2000-2002. The evaluation reported case studies of teachers introducing Information and Communications Technology (ICT) into their classroom practices. Both the evaluation case studies and this report were concerned to inquire into the way in which teacher professional learning affected classroom practices and student learning. The relationship between teacher professional learning and student learning, according to Serpell (2000) who was arguing within a review of beginning teacher induction, ‘remains elusive’. Case study methodology, as undertaken in this project, has allowed an opening up of the connections between teacher professional development provision, the form of school organisation, culture and interests and teachers’ and students’ classroom practices. The case studies presented teachers’ perceptions about the impact of ICT on students’ engagement in learning. Whether or not that engagement can be translated into enhanced learning outcomes for students is a question for further study.

What can be inferred from the data, which formed the case studies, is that learning outcomes, conventionally defined, may not fully describe the scope of students’ learning. The effect of the introduction of ICT into the classrooms of the teachers participating in the Project was that the relationships between teachers and students were disturbed from the normal. A similar observation emerges from the data on Project teachers’ relations with other teachers.

The essential task of the Project for the participating teachers was to respond to the demand for the integration of ICT across the curriculum. In the three schools, groups of teachers who were mostly quite untrained in the educational application of the new technology sought to explore its use in teaching and learning in the mainstream curriculum. For the Victoria University evaluation team, the striking feature of the Project was that it maintained the ‘cross KLA’ focus on classroom teaching and learning in all schools over the two years of QTP support. The clear impression is of three groups of teachers who have struggled with the introduction of ICT with varying degrees of success. On the one hand, the teachers conveyed a sense of collaborative achievement. But the accounts they gave also indicated that when ICT is the basis for innovation in education, it leads to the formation of local ‘elites’ whose effects are problematic.

Evaluation Methodology

Collaborative Practitioner Research is the title used by the Victoria University (2001) team to describe its approach in working with school colleagues who

* The Melbourne Catholic Education Office engaged the Victoria Research Team to undertake a summative evaluation of the project in the last months of 2002.
are interested in investigating their own practices. In the evaluation of the ICT Action Research Project, the short time available for the evaluation meant that the collaborative description and analysis phases of the research process were truncated. The collective theorising which is implied in collaborative practitioner research was virtually absent, unfortunately. The Appendix contains an outline of the methodology.

The Participating Schools and their Projects

The Melbourne Catholic Education Office selected three metropolitan, Catholic secondary schools, using an expression of interest approach, to receive funding over three years for action research into the application of information and communications technology (ICT) across the curriculum. The Commonwealth Government’s Quality Teacher Program provided Project funding which was earmarked for systemic consultancy support, for school-based, specific training and mentoring, and for program implementation costs at the school level.

A critical early development was the establishment of a partnership with an ICT Navigator School. The partnership, involving the provision of on-site and remote training, was conducted for the project group as a whole, also supplied software-specific training and methodology mentoring at each school.

An appreciation of the socio-economic and historical locations of the participating schools is essential for an authentic understanding of the impact of the ICT Action Research Project, and to appreciate how teachers learned about the application of information technology in education. Without such social and organisational caveats, abruptly reached conclusions generated after a surface survey of practices can misconnect what appears to be scant progress with a lack of professional learning in a funded professional development program. The participating schools were:

School A: A Catholic Secondary College for boys with a student population of about 600. The College’s ICT Action Research Project focus was years 7 and 8 literacy enhancement. School A was in the earliest stage of ICT use in its investment in technology and in its consideration of ICT in teaching and learning. As the ICT Action Research Project was finishing the College had finalised planning for a major and rapid program of ICT installation throughout the school.

School B: A Catholic Secondary College for girls with a student population of a little less than 700. The College’s ICT Action Research Project focus was a Year 9 integrated approach to Science, Health and PE and English. School B had rapidly expanded its provision of ICT especially in the Year 9
classrooms and was planning further developments including the establishment of a school intranet.

**School C:** A senior coeducational Catholic Secondary College with a student population over 700. The College’s ICT Action Research Project focus was on varied projects in a VCE only setting – mostly attempting deeper learning strategies within existing disciplines. School C entered the Project with the most advanced technological infrastructure. All teachers had laptops and a sophisticated ICT network, including an effective intranet, served the school.

The Nature of Student Learning

More than once, the VU evaluation team was reminded that the ICT Project concerned teacher professional development and that questions concerning any effect the Project might have had in improving student learning were premature. Throughout the case study data collection, however, the participating teachers provided quite detailed accounts of what they perceived to be distinctive developments in student learning observed as they introduced ICT into the classroom. The use of the graphic organiser ‘Inspiration’ was common to all three schools. In School C, a senior College, the complexity and depth of learning discerned by the media teacher, while the most complex analysis presented, was a tendency observed by teachers using ‘Inspiration’ in all the participating schools.

The advantage of brainstorming using ‘Inspiration’ was the speed at which it allowed students to put their flow of ideas on the screen – it really encouraged right brain thinking. They produced rich and detailed maps of information about different characters, locations and actions. This had an immediate and positive effect on the rest of the process. The next task they had to complete was to script an opening scene for a film from all the diverse information they had brainstormed. This involved making selections, editing, looking for and constructing connections – all left brain activities which previously had jumped in far too early in the process.

The scripts, shooting scripts and storyboards students produced on the basis of their Inspiration brainstormed material were significantly richer, more detailed, more interesting and more varied than before. The change from working in groups to working individually also had some advantages in this specific unit – in a group, students tended
to push their own ideas in the brainstorm stage, criticise
others’ ideas and some less vocal students would withdraw
into silence and not really engage in the experience.
Individually they entered their own imaginative space, created
their own maps and produced a substantial product.

The most frequently noted impact of the application of ICT in the classroom
was the extent of the enhancement of students’ participation and
engagement. Teachers described a shift from ‘teacher-directed’ to ‘student-
centred’ learning which at the very least indicated for them a potential for
improved learning outcomes and encouraged them to continue the
exploration of ICT in the classroom.

As you can see in my second project notes the students really
enjoyed the task. Students absolutely loved it. They were so
enthused about it. In fact they were disappointed when told
that our next lesson wouldn’t be in the computer lab, because
of access problems. Quotes from some of the girls included, “A
fun way of learning", "It's fun”, “I love the pictures”, “It really
makes you think”.

Students found the task challenging yet fun at the same time.
Instead of revision being just “chalk and talk” it became more
student focused. The beauty also was that all students in the
classroom, no matter at what level of ability, had the
opportunity to achieve. Students were enthused and to some
extent their enthusiasm and the positive experience gave me
the impetus to use it again.

There is no claim in this argument for a conclusive link between the use of
ICT, or at least of a specific software application, and improved learning
outcomes. As Connell (1994) has noted, the success of some compensatory
education programs can be attributed to the Hawthorne effect resulting when
additional funding from a high-status source has activated teachers’
commitment and enthusiasm. Such scepticism should not blind us to the
possibility that ICT may support improved learning as the teachers have
claimed. That many of the teachers participating in the ICT Action Research
Project made similar observations is evidence which warrants further
longitudinal study. From the perspective of action research, at least, the
cumulative insights from the different sources points towards the kind of
‘dialogic’ and ‘catalytic’ validation which Anderson and Heer (1999) have
argued exist in the findings of practitioner research.

The Practices of Professional Learning

When examined as a form of teacher professional development, the
experiences of teachers in the ICT Action Research Project confirm many of
the prescriptions for effective professional development presented in the literature. The applicability of action research, allocation of time and resources and the establishment of purposeful collaboration were conditions of professional learning clearly evident in the evaluation when teachers perceived themselves to be learning. Fullan (1999), building on the work of the University of Wisconsin Center for the Organisational Restructuring of Schools, has used the expression ‘professional learning community’ to characterise the ideal of teacher professional development. The features of professional development in such collegial environments are:

- Teachers pursue a clear purpose for all students’ learning
- Teachers engage in collaborative activity to achieve the purpose
- Teachers take collaborative responsibility for student learning

[And]

- Schoolwide teacher professional community affects the level of classroom authentic pedagogy, which in turn affects student performance
- Schoolwide teacher professional community affects the level of social support for student learning, which in turn affects student performance.

These theorised conclusions offer a reference point for the evaluation of the ICT Action Research Project and for the recognition of the achievements of the teachers and schools participating.

What Enabled Teacher Professional Learning and Enhanced Student Learning?

Organisational Readiness

A teacher in School A, lamenting the College’s current poorly developed ICT provision, and the relative lack of tangible development in the Project, remarked that ‘getting the infrastructure right’ was the necessary first step in providing the environment for teachers to take on ICT. That appears to be a fair point. Integrating ICT across the curriculum is a fantasy without access by teachers and students to effective and functioning technology. What appears to be an obvious condition is not however trivial in research terms because it indicates how important the school organisational environment was for the teachers in their explorations of ICT in teaching and learning.

‘Organisational pre-readiness’ might be the most apt description for School A. It was at a point where focused curriculum and teaching interests were intersecting with a large scale deployment of ICT infrastructure throughout the school. In the opinion of the participating teachers, the difficulties they faced in the Action Research Project were critical evidence for the senior staff to present to College Administration and College Board. The evidence was contained in a set of ‘diaries’ which the Year 7 teachers kept during 2002.
These accounts described the teachers’ experiences in seeking to use the limited classroom ICT equipment; and their frustrations at both the lack of equipment and its frequent breakdowns. ‘Top-down support for bottom-up change’ is the mantra of the school reform movement. What School A shows is how much the participants in the latter domain can marshal arguments with which to stimulate the generation of the former. Achieving change that way can have its personal cost however, which the accounts of experiences in the Project by the teachers communicated.

The impact of top-down support afforded teachers by ‘the school’ was the main organisational-level impression of the data collection with School C. In a senior College, with students enrolled in the Victorian Certificate of Education (Years 11 and 12), the teachers argued that the ‘high-stakes’ condition of their work dominated their participation in the Project. They recognised that pedagogy was an issue of great concern, but saw that it needed to be located within the responsibility of a senior college to prepare students for post-secondary education and careers. In thinking about ‘authentic pedagogy’, one teacher remarked, ‘We are worried about high stakes assessment. I do not think this has been our strength nor am I sure that we have even tried to deliver the VCE in the best possible way.’ As a result, the strategy adopted in the Action Research Project was to ask KLA leaders to explore ICT in their teaching and to use those personal experiences to encourage colleagues to conduct their own experiments. In a school where teachers were provided with laptops and with substantial ICT infrastructure available for teachers and students, that was a sensible and sustainable approach.

For the team to do both these things (develop personal practice and work in a structured way with others) was too big an ask however, and the project as it unfolded simply concentrated on the individual members developing their own practice and working informally with other members of their faculty to encourage greater use of ICTs.

School B falls between the extremes of Schools A and C. That observation does not relate to the Year level focus of the ICT Action Research Project, but to the unique connection the school and its teachers had drawn between ICT and pedagogy. School A, in its pre-readiness striving appeared to be initiating a long-term development which would bring technology and teaching approaches into integrated consideration. At the other extreme, School C had successfully and independently managed a substantial ‘roll-out’ of ICT. The questioning of pedagogy was following and was expected to emerge from the personal interests and work of the teachers. School B, because it commenced a connected examination of its curriculum and the place of ICT in teaching and learning, therefore was the example which furnished most explicit data on how ICT can be managed to re-construct teaching and learning.
At the commencement of the ICT Action Research Project, School B had completed a major curriculum review and had applied to join the Project because ICT had become a school priority. As a result teachers entered the project with a good deal of foreknowledge and with a sense that the school had initiated purposeful support for them. The Curriculum Coordinator introduced her case of practice, during the data collection, with a concise and telling contextualising of the Project.

When we started the project there was limited use of ICT across the curriculum. There was a high level of good will amongst staff and openness to learning but it was limited by the multiplicity of demands on them. The 2000 curriculum review had identified years 9 & 10 as needing some change in order to better motivate and engage students. As the College had only gone online at the beginning of 2000, there was also a need to engender confidence in the use of ICT tools.

The situation confronting teachers in School B was an inquiry formed around two related questions: enhancing the engagement of Year 9 students; and how ICT may contribute to improving student participation and learning. Connecting the technology with teachers' pedagogical interests and their moral commitment to students appears as an important condition for their successful induction into the application of ICT across the curriculum. As Hargreaves (1994: 73) has argued in a typically assertive claim

Putting an emphasis on the teacher as a person assists teachers in processes of self-understanding which are grounded in their life and work. It helps others to work with teachers more effectively. And it gives much-needed credibility and dignity to teachers' own practical knowledge of their work in relation to the pronouncements of policy makers and the theoretical claims of the academy. But when moral frameworks are missing, or senses of context are weak, approaching teacher professional development as a process of self-development has serious limitations.

Hargreaves' final sentence brings into focus the formulation of the ICT Project as action research. The local grounding of action research in the situations in which practice occurs enables the explicit inclusion of the moral sense and social contexts of the participants. As a result, the teachers participating in the Project were able to connect the Project's intentions with the immediate challenges which faced them: predominantly classroom-focused teaching and learning questions.

Teachers applying ICT through a curriculum lens

In all schools, the participating teachers recognised that ICT was, potentially at least, a means of improving student learning. Finding the curriculum entry
point appeared to be critical in teachers commencing to use ICT and to learn about its potential in teaching and learning. At School B, one teacher discussed her initial experiences with her colleagues:

I have made up different activities around ‘Inspiration’. For example my first lesson of the year for Food Tech is about safety, ‘Write down 5 safety rules, blah, blah, blah.’ Now I book into the lab and they do an ‘Inspiration’ thing on what are the links in safety and hygiene, the consequences and they have to think more. ... more interactive than just writing down 5 safety rules.

... you can do it this way or another on computer.

And tap into a different learning style. Those who are more abstract or random might like to use a graphic organiser and those who are more concrete and sequential might want to stick with pen and paper. (ICT) opens up more options.

Locating ICT within teachers’ curriculum concerns in the organised way that School B managed led to a collective awareness about the effect of the technology on students. That was reflected in the personal accounts of teachers in both School A and School C. The high stakes assessment in VCE, which was the condition of teachers’ work at School C, was the impetus for teachers to experiment with ICT in their classrooms. A Science teacher introduced her account with an explicit aim.

My idea was that students would enjoy coming to class and more importantly the Biology course if I could include experiences that they found enjoyable and allowed them to experience success. Success being that they were the ones producing outstanding work and receiving recognition of it rather than feeling that their work was mediocre in comparison to others simply because we stuck to one style of presenting our understanding.

This teacher had identified a direct connection between the potential of ICT and the engagement and level of esteem students held for the products of their learning.

As a result,

(s)tudents were encouraged to be as creative as possible in the presentation of the material but always reminded that underlying the multi-media was the understanding of the course work. Some students went way beyond my capabilities in IT and produced work using Flash and Movie programs. This in turn inspires me to find time to learn how to use these programs for my students next year so that I can be of more
use to them in the set-up of their presentations. Luckily I always have our AV technician willing to come into my classroom to sort out some of the bugs that crop up from time to time.

We attempted to use some class time to also allow students to exhibit their work to their classmates to inspire and encourage those students that were starting to wane in their enthusiasm. 3 months is a long time. The work was then transmitted to me in various ways, whether they learnt to use the school intranet and the class drop boxes from home or burned CDs or placed the PowerPoint on 10 disks it was another way of getting the students used to using IT. This of course did not always work and the students still had to be accountable to the submission dates given which meant they could not leave work to the last minute and expect that the technology would work.

The multi-media aspect, the outdoor experience, behind the scenes tour, use of specialised biology equipment, etc, allowed students to experience the Biology course in many different ways and achieve success. In terms of increasing the use of this technology throughout my faculty, I thought it was better to be an example instead of simply saying you must do this. Also if students were doing this in my class hopefully they would want to do it in other classes and some of these would be science subjects.

Despite the difficulties with technology at School A, the Special Education teacher had managed to work with students using ICT. The results for her were striking.

We also had subject discussion forums on line. They are a good way to communicate and boys can talk to each other and the teacher is a guide on the side. It can happen in any class and they can interact with each other through the forum and let the teacher and each other know when they are stuck.

The ICT made it easier for kids to express themselves, editing function, the fun and speed of it, getting a response quickly. Some Special Education students are computer phobic and they really don’t want to do it, but when they get a response they are turned around and become computer confident. They used a chat site and once we established protocols it was useful.

If finding the justification in curriculum, teaching and learning was the primary condition for technology-inexperienced teachers in successfully
introducing ICT into their practices, then making the ICT accessible, usable and immediately productive was just as important.

Situating ICT in personal understanding and practices: starting small

An excited discussion among staff at School B typifies the recollection of teachers who had successful experiences in introductory explorations of ICT in the classroom. The conversation suggests a kind of Piagetian assimilation/accommodation is occurring as the teachers grapple with the challenge of ICT as a teaching/learning tool. Teachers make sense of the technology through connecting it to curriculum demands, current classroom tasks and their interest in and relationship with students. In turn, the use of ICT in the classroom begins to alter classroom practices.

We got some good advice from Steve (the ICT consultant from Navigator Secondary College) to start very simply, with small steps.

That you could succeed straight away.

It was good to put us onto ‘Inspiration’. We got to brainstorm at the start about a possible focus and we thought that would be something nice and simple that could be applied across the curriculum. It’s quite easy to learn how to use. If we had started with learning how to design web-pages I don’t think …

… new technology in your classroom? I’d love to but I don’t have a clue. Some students are more advanced that you are.

… because you can use technology in the CSF and VCE. It’s about learning …

But another beauty was that that we came from different KLAs.

The choice of a software package such as ‘Inspiration’ appeared to be the result of sensible advice from the Navigator school, and not the only wisdom which the Project consultants provided. Neither overly complex, nor trivially repetitive, ‘Inspiration’ enabled the teachers in all schools to include ICT into their planned activities without a sense that the technology was taking over. Its layered structure allowed students and teachers to demonstrate understanding in a range of curriculum areas using concept maps, an outcome related quickly by the teachers to the possibilities of the Thinking Oriented Curriculum, which was at least under consideration in all schools.
The ‘starting small’ strategy also gave confidence to teachers who found the internet a congenial environment to work with students in exploration of ICT. Teachers and students welcomed the accessibility and ease of searching capability of the internet, qualities which they found were beneficial in supporting open-ended research projects in VCE.

There was a buzz in the room as students were working on various history topics for Nazi Germany. “I’ve got it. I’ve found the web site with these awesome pictures,” but the comment then was, “how do I get them off the internet?”

“Guess what I’ve found a great web site with Schindler’s List but I’m not sure how to get it off the net”. I responded, “I’m not sure but what I will do is let’s go over and ask another student who knows these things and we will get him to help us”. The other student is able to help us and we are able to get the images downloaded. But we strike another issue: some of the images have been blocked by SINA our internet provider.

I said to the student, “Don’t worry I will go and see the tech guys and they will help us”. I left the main area of the library and went and saw the tech guys who are just in a room off the main area of the library. They said it would take two days for the restrictions to be lifted. I informed the student that it would be best to take note of the web site and copy it onto disk and bring it to next class. The great thing about this time was the exchange of skills and knowledge between students - the technical exchange and the content knowledge. Students would yell out or go and see the other students and say guess what I’ve got this great web site you can use.

Starting small meant that the ICT remained connected to teachers’ main teaching and learning responsibilities. The KLA learning continued to be the focus of class activity. Had teachers been required to build ICT practices around a higher-order ICT demand - webpage design might be one example - in all likelihood their struggle to apply the technology would have become their principal concern. The result for most would have been overburdening frustration and a withdrawal from the ICT experiment. As Blyth (2002) has noted in the context of the widespread introduction of laptop computers into Victorian schools,

(skills and knowledge need to be understood in terms of the context within which they operate and the meaning they have for that context. … A concern for skills outside of an ‘authentic’ context of social practice is seen as counterproductive. This places learning rather than technology in the foreground.
Having the narrow focus of ‘starting small’ is clearly a significant message about professional learning using ICT, especially when action research is the learning methodology. Equally important is that the start is successful. The possibility for teaching failure is a major concern for teachers. That the technology difficulties in the immediately preceding extract did not lead to the teacher’s and students’ frustration is evidence that the teacher had constructed a classroom environment characterised by effective class relationships established through flexible and accomplished teaching practice. Getting the technology right was an essential requirement, however, for ongoing success.

Accessibility and troubleshooting: the importance of technical support

The question of the technical effectiveness and stability of the information technology in the schools may not appear to be matters associated with how professional learning developed in the ICT Action Research Project. But having properly functioning technology was an essential pre-requisite for learning. When the technology was ‘down’ or teachers experienced a technological ‘glitch’, the principal learning was that working with ICT was risky and frustrating. ‘Starting small’ makes sense as a condition of action research. But there is no ICT action to research and no professional learning when the technology fails. School A, in its struggles to bring ICT into the mainstream curriculum, typified the problem and the consequences of technology break-down.

The only ICT we had was in the specific classes so we needed to make this about action learning for a small start with no real deadline. We faced lots of difficulties with the technology breaking down, access to the lab was very limited but we managed to get 1 computer in each year 7 class. Teachers would come and say, ‘Why aren’t these computers working?’ ‘Marie why can’t I use this software.’

Hardware problems weren’t the only concern of course. When a teacher remarks, ‘For me that was huge – to use the internet to email was like flying to the moon’, the last thing the teacher wants is for the technology to become inoperative. When discussing the value of visiting an ICT Navigator School and working with an ICT consultant, the Project team at School B presented a picture of professional learning as emerging from an inquiry immersed in their own practices and those of their colleagues at the school. For teachers who are novices in ICT use, learning about ICT is not to take on a value-free add-on, but requires strategies of professional learning which need to be grounded in personal practice and collaborative relationships.

But being able to send all the Year 9 staff to the Navigator School, to really see concrete evidence of how it works in a classroom, where there was a fear on some teachers’ behalf
that about – oh, computers in a classroom, they won’t get turned on, they won’t be used, four to a classroom, they might be useless, all that sort of thing. When they can go and actually see it for themselves it makes a difference.

...

For our group itself, I think that initial direction was really important, but then I found it more valuable to ask Jim (the school’s Learning Technologies Coordinator) for direction rather than the consultant.

Depends on people in the group.

I found it more useful doing that rather than getting help from the consultant.

But obviously the consultant had an idea where to start.

That’s right initially.

But maybe if you didn’t have someone like Jim in the group then you would be depending more on the consultant.

VU ... expand more on why you found Jim to be more valuable.

Because of the familiarity, I felt more comfortable, he knew where we were going. He knew the culture of the school, he had a good understanding of what was going on. I found that to be a lot more valuable than to talk to the consultant.

Oh to get the consultant out to fix things? It’s little things, it’s not the big things. Something really small.

When teachers are unfamiliar with ICT seeing the vision and starting small are not enough. Each new excursion into uncharted ICT territory is a new start: starting small is an everyday occurrence for the teacher untrained in ICT. Having ongoing success in introducing ICT into the classroom, however minor the advance may be, appears to be a condition for professional learning needed for the ICT novice to learn more complex applications. For teachers in School C it was ‘important to have someone with the authority, time and preferably knowledge to be able to work with network staff and systems staff to design learner friendly environments, rules and network/intranet solutions.

How the ICT related to teaching and learning
Prensky (2001) has presented a provocative image of the school classroom in the current era, when ICT is the new technology. He writes of many teachers being ‘digital immigrants’ in schools and society. They are attempting to be the educational leaders for many young people who are ‘digital natives’ and quite at home in the ICT environment. The metaphors are useful because they indicate what might be the opportunities and risks associated with ICT in education. Teachers appear to be the learners when they engage with students in the context of ICT. That results in possibilities for a restructured teacher-student relationship in which research, often collaboratively organised with other students, becomes the form of classroom practice.

Next phase, students need to able to create their multimedia presentations. This time I booked the computer room early and negotiated with the English teachers for the computer rooms. Students had one week to get their presentations ready. It was great students worked at home. They did their own homework and set their own goals. Those who didn’t know how to do things asked their friends on how to do web pages or power points or asked those students in the classroom who were savvy with IT. I’m surviving here. If I didn’t know something, I said I would find out from other staff-audio visual person or my colleagues or as I was teaching in my other classes and ask students. I had no boundaries in asking for info. Students were great in telling me info because they knew the short cuts.

The result of such student-centred participation for this teacher was not just creative engagement with ICT. With some trepidation, she awaited evidence of the way the students had learned in her subject.

The ultimate test is the exam. Will I get better quality work, ideas, development of concepts in the student’s exams, especially when they need to write under pressure? Am I game enough to open these exam papers and start marking? Yes I need to know if all the negotiations, the pushing of tech guys, the programs, the pitfalls and developing mine and the student’s skills have been worth it!! Let’s mark! Two hours later, a smile comes across my face, a sense of relief and fulfilment emerge. Yes, by George I have done it. I have swum the marathon! This is the way to go! Time to move on from total reliance on traditional modes teaching. Time for History to live! Time for challenge! I wonder how I can improve this for next year. What skills can I now learn..........?

In each school, the participating teachers contributed similar accounts of practice in which some of the students, as digital natives at ease in the ICT environment, had become the teachers of their classmates as well as their
class teachers. This shift, constituting a substantial change in the knowledge and skill structures framing an alteration in classroom power relationships, must surely be the practice which will be most difficult for teachers; old-hands in conventional classrooms but tyros in the digital world. The transition from what was frequently termed a ‘teacher directed’ to a ‘student centred’ classroom resulted in the kind of interactive two-way learning reported above.

Practices such as those were not confined to the individual classroom. New ICT learning entered the discourse of many more students throughout the school.

The experience of using Inspiration in Media also had a ripple effect outside the Media classroom. A student who had learnt to use Inspiration in Media went to her next English class where the teacher wanted to use Inspiration but had no idea how to. In a matter of minutes she demonstrated the use of Inspiration to the class and away they went creating character and thematic webs.

If the metaphor of ‘digital immigrants’ and ‘digital natives’ holds true, then conventional transmission conceptions of teaching and learning may be quite inappropriate. The form of student learning, and teacher learning too, may be closer to second language learning ... second practice learning perhaps ... than to what is regarded as normal practice in the mainstream KLAs. Establishing ‘the conditions for learning’ how to use technology might be a better formulation than being trained or taught how to use it. In an appropriation of the discourse of language acquisition, Cambourne’s seven conditions of learning (immersion, demonstration, engagement, expectation, use, approximation and response) may be as good a description of the practices needed for learning to use ICT in teaching and learning – for teachers as well as students. As with young children learning to read and write, effective learning in ICT cannot be left to chance. It needs a planned and managed approach. The teachers in the Project were in little doubt failure would result unless the whole school was behind any ICT initiative.

Whole School

School A was clearly the Project participant which found most difficulty in establishing and sustaining a viable ICT development. But in its struggles can be seen the essential structural condition for the successful introduction of ICT into teaching and learning across the curriculum.

The Principal, the President of the College Board who is an IT executive and I went to visit Navigator Secondary College. ...

The Board level has seen a major push and the budget has been looked at. I presented a proposal on behalf of the team for additional professional development as urgent and they
went to the school Central Committee and we have finally been offered some additional funds and re-aligned the budget so that we can do this.

The change has been in us and in teachers. In my role as PD co-ordinator, it has been a great way to review our curriculum, in terms of multiple intelligences and thinking. ICT is an opportunity for faculties and we have asked them to look at their policies and documents and ask, what is it we value about teaching and learning and how can ICT help us?

If we are expecting staff to work on computers next year, they need them now not next year. Staff computers have been moved and where they are now, they are set up in a location where people can work and talk about their work - the dialogue around them is great.

This account of the situation at School A indicates how new practices require school-level structural support in opening up the possibility for innovation. It also indicates that the macro-structural decision at Board level needs to be supported by micro-level development of new discourses about teaching and learning as well as the use of the technical language of information technology.

In all the schools in the Project, there was an explicit awareness expressed that successful application of ICT across the curriculum required a ‘whole school approach’. The ‘trickle down’ approach in School C, after a major investment in infrastructure and hardware, will be a path followed by few schools. More likely, the successful strategy for development will look like that adopted by School B. Without seeking to overload the significance of the last two years at School B, its implementation of ICT appears to have a good deal in common with the characteristics of the professional learning community proposed by Fullan (1999). Important developments at School B have included:

• The active engagement of the College Principal by the ICT team in the planning and implementation phases
• The inclusion of teachers from ‘cross curriculum’ KLA teams
• Collective goal setting
• An emphasis on the awareness of and reflection on student learning as the starting point for change; the setting-up of a PEEL* group at the College is a powerful sign of this student-centred orientation and practice
• Complementary school-wide initiatives including the establishment of an ICT Reference Group, on which two members of the Project team serve

* PEEL: Project for Enhancing Effective Learning, an initiative sponsored by the Faculty of Education at Monash University.
Concerted re-assessment of curriculum with a view to introducing innovations such as the Thinking Oriented Curriculum, which the teachers regarded would strengthen and be supported by effective use of ICT.

In addition the success of the ICT Project at School B can be related to the recognition by the College administration that it needed to support requests by the Project team for substantial ‘chunks of time’ to meet each term, instead of ‘flapping around trying to find time’ after school when it was difficult to get ‘the whole team together’. Collaboration and collective achievement mark this way of working.

Professional Learning in the ICT Action Research Project

What was striking in all schools was that teachers’ learning about ICT through their own classroom practice became the basis of their rapid growth as teachers of colleagues. In all schools, the groups of teachers who participated in the ICT Action Research Project are now expected to be leaders of ICT professional development for colleagues. Their preferred mode of teaching was informal, after school or in the spaces in the crowded timetable when teachers find time for conversations. In many respects the teacher struggling with ICT is the colleague sought out to give advice. The language of the IT expert confronts and baffles the novice.

The fact that we weren’t technology teachers made a difference too. They could see that we were Science, Biology, anything. It really made a difference.

I think IT teachers are on a different level. They talk about RAMs and megahertz and whatever.

Jargon.

Even if you go to an IT session at a conference.

That means that if I (the IT Coordinator) get up at a staff meeting and say you can do this or the other, people will to some extent have that reaction. They answer I’m an IT teacher. It’s not really for general staff.

It’s not just that barrier. It’s also that we don’t know the language.

The currently appropriate term for the preferred professional learning by the teachers in the ICT Project would be ‘workplace learning’ (Beckett and Hager 2002). Workplace learning these authors argue should not be condemned as mere technical skill development. It is ‘learning by doing’ as one teacher
suggested and it may be informal. But practice in workplaces and learning
from practice in workplaces, so as to improve it, is characterised by deep
understanding which requires knowledge-based, philosophical and ethical
inquiry.

Contained within the conversations in which practitioners engage as they
grapple with everyday practice, such inquiry attains the status of formal
discourse when teachers are required to explain why they have worked as
they did. While the conversations among the teachers at School B appear to
have been closest to a ‘discursive’ ideal (Giddens 1984), those in the other
schools too should not be discounted because they were less obvious.

‘Going public’ appeared to be the stimulus for practitioners such as teachers
to recognise that their understanding and practices were under most
challenge. When the teachers were asked to present an account of their local
activity to colleagues in the other participating schools, they expressed a great
deal of concern. ‘Nerve-racking’ was a reaction shared by many teachers.
But the experience of successfully communicating to other teachers was
highly affirming of personal knowledge: so affirming that it might be a
worthwhile strategy in similar programs of workplace learning. The outcome
of professional learning is the potential for professional leadership.

Action Research

Being public is one of the two criteria which Stenhouse (in Rudduck and
Hopkins 1985) has proposed as at the core of research, especially in fields
such as education. Being systematic is the other requirement. Action
research is a way of being ‘systematic and public’ about practical situations. It
is grounded in the principle that those who are actually engaged in the
practice or the situation in which the practice occurs are the ones who also
undertake the research’ (Grundy 1998: 16). The implication of the selection
of action research as the ‘method’ for the ICT Project is that the
understanding of practice and its development will emerge from teachers’
systematic and public inquiry into their own struggles to improve their
practices and opportunities for their students.

The conception of the ICT Project as Action Research implied therefore that
teachers would undertake a good deal of what in conventional research is
termed ‘data collection’. While the schools did document aspects of the ICT
Project, including records of planning and professional development
presentations, there was little in the way of ongoing data gathering in any of
the schools. Two schools kept diaries or an online journal for a part of the
two years of the Project. Data used by the participating teachers and the
evaluation team for use in reflecting on the Project was gathered during each
evaluation only. That observation may or may not be significant, especially
for funding authorities.
In the opinion of the research team, formal documentation has its value but should not be a demand that gets in the way of the action. Yeatman and Sachs (1995) have written about a ‘spirit of action research’ which may be the essential criterion for change in schools which has as its base practitioner understanding. That condition - the spirit of action research - certainly appeared to be alive in the teams of teachers participating in the Project. What may be needed is less some technical attention to presumed rigour in research than what Cochran-Smith and Lytle (2001) have termed

... an inquiry stance on teaching that is critical and transformative, a stance linked not only to high standards for the learning of all students but also to social change and social justice and to the individual and collective professional growth of teachers.

Such a moral perspective on practitioner research is put at risk by emphasising formal data collection. Moral purpose and the cause of socially just action are contained, if Habermas is to be believed, in a dialogic coming to agreement by committed practitioners.

Absence of data, however, does have one significant consequence: the inability of teachers to communicate widely and effectively. As the Curriculum Coordinator in School A, noted.

Teachers also kept diaries of their experience. Having teachers’ diaries and citing them with regard to the frustration that they experienced in the classroom gave a credibility and put the experience in a real context and that started to move things.

The diaries were useful in constructing an argument to be made to the College Board for a major ICT infrastructure development.

What the evaluation did demonstrate was that teachers in schools find documentation of practice, as a matter of course, very difficult and time-consuming. If documentation is important for funding authorities, then teachers will need specific support and resources to undertake it.

Principles for further development

Many of the features of the 2001-2002 ICT Action Research Project appear to be appropriate principles for similar projects in the future. The conception of the Project as one which

• provides a clear focus
• engages a relatively small number of teachers who share a common interest
• ‘starts small’ and starts from the participating teachers’ interests
• supports the teachers with expert and accessible professional development and technical assistance
• provides ‘chunks of time’ for the participating teachers to work together
• and enables participating teachers to affirm their professional learning by leading the professional development of colleagues.

This has been demonstrated to lead to substantial progress in teachers becoming accomplished users of ICT in teaching and learning. Arguably, in one of the participating schools, the Project has supported if not initiated the development of what Fullan (1999) has termed a ‘professional learning community’.

The evaluation of the Project has established that its initial formulation led to substantial developments in teacher professional learning. Consideration may need to be given to the following means of strengthening of practice in future projects.

1. From the beginning of a similar project, the expectations on the nature of teachers’ participation should be made clear. For example, staffing practices in schools which mandate the involvement of a group of teachers without their agreement is a management practice to be avoided.

2. An agreement between a ‘school executive’ and participating teachers about specific expectations and level of support should be explicit in the negotiation over the involvement of schools in any similar project.

3. An existing team-based staffing and curriculum practice may be essential for sustainable and effective action research. Schools selected to participate in a funded action research project should be able to show how staff teams currently exist or will be encouraged as a result of the project.

4. A willingness to document the changes occurring in an action research project; open ended documentation, particularly of the practices of teaching and learning, is not an easy task. The Catholic Education Office might consider the development and use of a simple ‘protocol’ for documenting action research projects as a means of creating clear expectations for teachers. The documentation task may also require that teams of teachers work with a ‘critical friend’, not within the teaching and learning focus but on the action research process.
A final reflection: the dark side of innovation

Giddens (1984) has suggested that social science might be regarded as a process of uncovering the unacknowledged conditions and unintended consequences of human action. Such opaque qualities are rarely evident in the course of action even if conducted within the enabling environment of action research. Separation, emotional as well as temporal, is needed for an assessment of the effects of planned change. That is a luxury which is unavailable to education practitioners working under even the most supportive of conditions. In the project evaluation reported in this paper, neither time for extended reflection by the practitioner researchers nor their emotional detachment were possible. Being able to stand back and look at ‘the work in progress’ is a strategy barely possible for university researchers. They (we) have the totality of the data and the time to examine the effects of the ICT Action Research Project; and also the lack of any personal investment in the changes in each school, a feature making relatively painless the recognition of negative consequences of action.

As a result we advance these final comments with hesitation. We make them because our work in teacher education is little different from that of our colleagues who exposed themselves to scrutiny in this evaluation. That is, we intend that the study will inform our own teaching and course practices. We note too that the insight is merely arguable and a starting point for further inquiry.

Looking back at the account of the evaluation, one aspect of the study has given us cause for concern. It emerges from the social practice standpoint of this research which has made evident how much change in places like schools is based in personal agency and personal power. Both agency and power are located, initially, in existing institutional structures and patterns of control. As a result of the introduction of ICT at each school, taken-for-granted relationships and routines appear to have been disturbed. Inside classrooms, the research has shown how teachers have become learners and the nominal learners (school students) have become teachers. Within a staff, the school case studies portray how young teachers have taken on powerful, if informal, leadership roles through their developing ICT expertise and its pedagogical applications. If a teacher had worked out how ICT could be incorporated into classroom practice, then colleagues acknowledged that achievement by requesting professional development support, for example in after school hours demonstrations. Similar practices were observable in the relationships and interactions across school sites, none more explicit than those involving the ICT consultant from the Navigator school.

The unrecognised effect of the social practices, revealed through the evaluation, appears to be formation of new social groupings in the schools and across schools with access to the privileged domain of ICT as the principle of group organisation. Through the emphasis on ICT, schools and education systems are establishing the conditions for the formation of new
kinds of ‘elites’. Being selected by the education system for inclusion in the innovation and to receive additional funding confers on these elite groups, however incipient they may appear in this study, a substantial advantage in education markets. Prestige titles such as ‘Navigator School’, ‘ICT Consultant’ and ‘ICT Coordinator’ signify how ICT has contributed to the reform of teachers’ practices around advancement in a policy and management environment based on competition within schools and between schools.

At one level, the drive to integrate ICT into school curriculum and pedagogy, can be interpreted as the ongoing marketization of education in a global economy (Smyth, Dow, Hattam, Reid and Shacklock 2000). In that conception, the whole range of innovation drives the formation of new elites and the reconstruction of power relationships in education. Depressingly, the path of innovation in education seems to result in the construction of the kind of local, national and global hierarchies associated by Wright Mills (1979) with the major social institutions. It may also be another working out of Bernstein’s longstanding proposition that particular forms of pedagogy and curriculum reflect dominant power interests (eg see Bernstein 1996). Social division along some kind of ‘class’ lines may be the general accomplishment of innovation, however socially progressive the intentions of the innovation’s proponents are.

The trajectories of the initiation and dissemination of prominent innovations such as multiliteracies, authentic pedagogies, productive pedagogies and ICT supported education development in general appear to be associated with the construction of new educational elites. These new elites have a local character, as hinted at in this study, but they have also transcended state and national boundaries. In his analysis using actor-network theory, Bigum (2003) has argued that successfully implemented change may depend on ‘the recruitment’ of powerful allies to the cause of the innovation. That analysis is a more than plausible account of the current condition of education in Australia.

A generalised explanation of the course of innovation may lead to the overlooking of other possible interpretations of the data in this case study. Arguably the introduction of ICT is different from other innovations in education. Prensky’s digital ‘natives’ and ‘immigrants’ dichotomy suggests that re-constructing teaching practices using ICT is not only pedagogical change (if indeed it is pedagogical change!). The change is not just a matter of locating ICT in practice; it may be that the change is better interpreted as re-locating practice in ICT! From that perspective, ICT is the basis of what Bard and Soderqvist (2002) have termed the ‘new power elite’ of the ‘netocracy’. For them, the change potential of computing is not in the possibility of artificial intelligence, but in the power of the virtual networks which users of the internet construct. Those that can adapt to and engage in these networks will create powerful new groupings unconstrained by assumptions about ‘old’ ways of creating and transmitting knowledge in bourgeois institutions such as schools and universities. In the differential
enthusiasm for and expertise in ICT shown in this study are arguably elements of evidence of the ways in which the ‘netocracy’ is constructing itself and how some teachers and students are becoming ‘netocrats’.

Proclaiming only the dark side of innovation can also be a misreading of course. Power has constructive as well as negative effects as Giddens (1984) has argued against Foucault. In this case study, the potential for elite formation appears to be at least muted when innovation is located in a dialogic practice inclusive of colleagues about the sharing of privileged knowledge. What this ‘snapshot’ of practice has shown is that kind of dialogic practice is grounded in teachers’ moral commitment to the students in their classrooms.

References


Appendix: Evaluation Methodology

The evaluation comprised the following stages:

Part A: Cases of induction practice written and analysed by participating teachers within a framework of collaborative practitioner research. Participating teachers illustrated the cases with ‘portfolios’ of practice artefacts: records of planning and evaluation meetings, class planning records and samples of students’ work.

Part B: Validation roundtables with beginning teachers. These interviews enabled the participating teachers to confirm tentative findings generated in Parts A and B. The interviews were semi-structured and were recursive inquiries into the case writing and artefacts of practice.

Part C: Writing of case studies through a cycle of drafting, validation by participating teachers and re-drafting. Given the constrained evaluation and research timeframe, only one cycle of drafting, validation and re-drafting was possible.

Part D: The research team engaged a sub-contractor for the preparation of digital versions of the case studies which were then loaded onto the participating schools’ websites.

Part E: Using the results of the collaborative practitioner analysis, the VU research team wrote a research paper which investigated the extent to which the Action Research project initiated change in each school and promoted effective professional learning by participating teachers.