Getting together to learn more about ICT use: Findings from the TELA evaluation

Ann Harlow
and
Bronwen Cowie
Wilf Malcolm Institute of Educational Research, The University of Waikato

Abstract

The introduction of computers, the Internet, and other Information and Communication Technologies (ICTs) into the school context has proved challenging for many schools and teachers. In meeting these challenges, professional development for teachers has been seen traditionally as a formal process conducted by an expert from outside the school. Situated and sociocultural views of teacher learning challenge the efficacy of this model and, recently, the notion of professional learning communities has gained traction. Such an approach emphasises collegiality and collaboration both within and across schools.

This paper examines the nature of professional learning opportunities experienced by New Zealand teachers following their receipt of government subsidised laptops for their personal use. It also discusses the challenges to teachers and school communities in fostering and supporting teachers learning more about ICT use.

Introduction

Current conceptualisations of teacher professional development recognise that teacher learning is as much a social as an individual process. Teacher learning is shaped by a teacher's individual beliefs and expertise as these interact with the local social, material, and cultural context for collaboration and change. Cunningham, Kerr, McEune, Smith, and Harris (2003) identified and described teacher-level and school-level barriers to teacher ICT use, acknowledging that these two levels influence each other in complex ways. Broadly speaking, the teacher-level barriers comprised teacher attitudes towards ICT such as self-confidence with ICT, perceived relevance of ICT, and innovativeness, whereas school-level barriers were related to lack of available equipment, resources, and support. Zhao, Pugh, Stephen, and Byers (2002) by contrast, adopted an ecological perspective and identified three interactive domains as impacting on the implementation of ICT innovation in schools: the teacher, the innovation and the context. Zhao and his colleagues concluded that the teacher plays the most significant role: when the teacher was strong in terms of technology proficiency, pedagogical proficiency with ICT use, and social awareness, then an innovation had a better chance of success even when the innovation had a high degree of distance from, and dependence on, technology outside the teacher's control, and the context was less-than-supportive. Building on this study, Zhao and Frank (2003) found that innovations cannot be implemented without regard to the internal social structures of schools and the other external social and political pressures or forces that school face. They concluded that it was likely the distribution of technology implementation was a function of the distribution of social relations within the school, although it was also shaped by external factors. Other studies have suggested that teacher learning should take place as a collaborative, professional, endeavour in a community of practice, and that time and professional support is required if changes in teachers' technological beliefs and practices are to take place (Levin & Wadmany, 2005; Webb, Robertson, & Fluck, 2005).

The Tela Evaluation Study

The six-year (2003-2008) national evaluation of the impact of the Teachers' Laptops (TELA) initiative on New Zealand teachers' professional lives also sought to explicate factors that enabled and constrained teacher laptop use. The research orientation was an empirical mixed-methods approach with data collected over three-year cycles of nationwide surveys and regional focus groups targeting teachers at four different levels across the compulsory education sector: Years 1 to 3, Years 4 to 6, Years 7 and 8, and Years 9 to 13. Long-term school case studies were conducted in eight secondary schools. Over 1400 teachers have been involved in data collection.

For each of the levels a stratified random sample of ten percent of schools was taken, and the teachers at the schools at the relevant year level were invited to participate. Table 1 summarises the respondents.

Level	Year 9-13			Year 7-8			Year 4-6			Year 1-3		
Year	2003	2004	2005	2004	2005	2006	2005	2006	2007	2006	2007	2008
Respondent schools	49	48	50	37	43	70	101	112	131	102	119	100
Respondent teachers	688	744	690	175	153	149	200	279	353	271	340	317

Table 1: TELA evaluation respondents

The survey questions were designed to provide prevalence data on different types of teacher use of the laptops and the kinds of support they had experienced for these uses. Many of the same questions were used across the year groupings and across three year cycles of data collection, so that comparisons of frequency of use and patterns of use over time could be made.

The focus group component of the study allowed for exploration of the issues associated with teacher use of laptops. One continuing topic for focus group discussions was what kind of professional tasks were being undertaken using the laptop. Patterns of use over time and changes in laptop use were discussed by focus groups each year. Teachers were also asked to comment on factors that enabled and constrained their laptop use and their goals for the next year. The focus group discussions enabled researchers to understand more fully the impacts on teachers' professional lives and to explore the factors that influenced these impacts.

The focus of the Year 9 to 13 school case studies was on the uses that teachers were making of their laptops, changes in the teachers' use of the laptops over three years, and the factors that enabled and constrained teacher use of laptops. The main purpose of carrying out school case studies was to examine the impact of the laptops on teachers' professional work over time at the school and classroom level. In this way the case study, questionnaire and focus group components of the study would build on each other to help the researchers gain insight into teacher experiences as they used the laptops within the overall social, cultural, organisational and technological context of their school.

The TELA evaluation findings suggest that the system of teacher personal expertise, school technological infrastructure (hardware, software, in-school expertise and technical support), teacher access to professional learning opportunities, and school leadership enable and constraint teacher laptop use. These factors individually, and in combination, shaped the context for teacher learning about laptop use (Cowie, Jones, Harlow et al., 2007a, and 2007b). In this paper, however, we restrict our focus to themes from teachers' commentaries on their experiences and preferences for professional development and learning more about ICT use.

Opportunities For Professional Learning

Professional development was said to be vital because it enabled teachers to gain skills and confidence in using the laptop as well as a vision for the different ways they could use it. Nearly three fifths of secondary teachers (58%) reported professional development to be one of the most important things they needed to help them to use their laptops effectively in the classroom. Around a half of primary teachers rated access to professional development as a very important influence on their use of the laptop. A sixth of them (Y7-8: 17%; Y4-6: 13%; Y1-3: 14%) rated professional development and support as the most important influence.

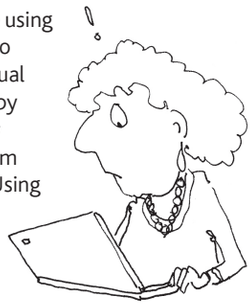
The findings indicate that teachers experienced professional learning for laptop use as a process of individual investigation; a process that involved, or at least was best when it involved, immediate colleagues. The process might take place across a school as a whole, and it could involve teachers working across a cluster of schools to share solutions and problems.

Professional learning as a process reliant on the individual investigator

Teachers spoke about professional learning as an individual process that involved exploration of and experimentation with their laptops. They expressed a preference for time to explore how to use their laptop. Secondary teachers in the focus groups, irrespective of their self-rated level of expertise, discussed the role that personal exploration and experimentation played in their learning. Teachers who were inexperienced, often reluctant, computer users indicated that a personal laptop provided a safe and flexible environment to learn about and become familiar with a range of computer applications. They were able to take the time they needed to develop their expertise with a particular function, and could seek help at home and at school from family and friends whom they trusted to help them without denigrating them. In this way they were able to consolidate their learning. Secondary case study teachers also highlighted the need for time to explore and experiment with the programmes on their laptop and what was available via the Internet and other sources. Time to explore the capabilities of the laptop was seen as particularly beneficial by teachers with less expertise, but all teachers wanted the time to consolidate what they learned from others.

As a result of these discussions primary teacher questionnaire respondents were asked to choose the "most important factor" affecting their effective use of the laptop in the classroom. Between a sixth and just over a quarter indicated "time to experiment with laptop capabilities and to practise with use for teaching" was the most important factor in the third year of the evaluation for each group (Y7-8: 27%; Y4-6: 17%; Y1-3: 16%). Primary teachers also spoke of the value of time to explore and experiment or 'play' with their laptop as part of a process of learning what they could do with it.

> *When setting up websites, having someone floating around helping you if need it. Having 'time' to sit and play and learn as you go! (Y1-3 teacher, 2008)*



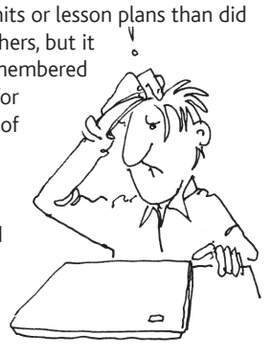
Teachers were using their laptops to pursue individual development by accessing new knowledge from the Internet. Using the laptop as a tool to access the Internet for professional readings, teacher association news, etcetera, was done by the majority of teachers (Y9-13: 86%; Y7-8: 91%; Y4-6: 86%; Y1-3: 89%). Almost all teachers at every level made at least some use of the laptop to access online curriculum and assessment materials (Y9-13: 93%; Y7-8: 92%; Y4-6: 94%; Y1-3: 91%), and up to a third of teachers used their laptop to participate in online discussions (Y9-13: 30%; Y7-8: 23%; Y4-6: 33%: Y1-3: 31%), including web conferences:

> *Web conferences are great. Online training in self-paced modules helpful. (Y1-3 teacher, 2008)*

A process that involves immediate colleagues

Sharing ideas with other staff members was mentioned positively as a source of professional development by teachers from all levels of schooling, with between a half and three quarters of teachers reporting that other teachers in the school were very supportive in helping them to use the laptop effectively as a teaching tool (Y9-13: 50% other teachers, and 30% departmental colleagues; Y7-8: 57%; Y4-6: 68%; Y1-3: 73%). Peer mentoring and collegial support was identified as an important mechanism for enhancing their use of the laptops for teaching and learning.

The laptop was said to have fitted well into teachers' professional culture of collaboration. A higher proportion of primary teachers indicated they used their laptops for the collaborative development or sharing of units or lesson plans than did secondary teachers, but it needs to be remembered that the years for the final round of data collection that led to the quoted figures spanned the period 2005-2008 inclusive.



The level of use was as follows: Y9-13: 68%; Y7-8: 82%: Y4-6: 86%; Y1-3: 87%). The laptops were said to facilitate the sharing of resources, which could be customised easily.

Just under half of primary teacher questionnaire respondents rated a collaborative culture for laptop use as a very important influence on their use of the laptop. During the focus groups for all levels peer mentoring, preferably from onsite colleagues, was construed as more likely to be relevant to teachers' immediate circumstances. Colleagues as mentors provided access to models of how a laptop could be used in a safe and secure environment. Assistance was available when the need for it occurred and in the context where ICT was to be used.

Peer mentoring had the added benefit of enhancing teachers' sense of belonging to a professional learning community. Teacher comments indicated that a collaborative culture, proximity, and the public nature of laptop use in teachers' workrooms contributed to the diffusion of ideas between teachers. Secondary teachers preferred to work with their same subject colleagues because of this. They indicated that this built on and supported a culture of collaboration and sharing:

> *That's happened with my colleague in the Physics Dept. I've been doing these PowerPoint presentations. We're just wandering in and out of each other's classes, like, "I need to know how to do this." He's using my laptop and showing his kids my presentations and he came up yesterday and said, "Look, I want to learn how to do this for myself so I can pay you back." So tomorrow I'm going to teach him how to do these things. (Year 9-13 teacher)*

A focus group teacher described the situation in his workroom thus:

> *You can see learning happening [in the workroom]. People ask questions, they ask for help, others listen in. There is a learning environment happening. (Year 9-13 teacher)*

In this case it appears that informal peer mentoring around the laptop took place in the context of a professional learning community (Senge, 1994).

Indeed, the general consensus across those interviewed was that without the collaborative culture that exists amongst New Zealand teachers very little progress would have been made in the use of the laptops/ICT.

There was discussion amongst focus group members at each level of the evaluation as to whether informal peer mentoring was enough. This was a focus of sustained debate at one of the secondary focus groups. One view, strongly supported by a teacher from a small school, was that input from experts or "outside people" was necessary to extend thinking:

> *If you come from a small school you come with a small body of knowledge. You've got no professional development, as in bringing in outside people; we will never progress beyond sharing [ideas]. (Year 9-13 teacher)*

The teachers at a small rural primary school focus group also discussed this issue. They reached a similar conclusion.

School-wide professional learning and development

Within a school there were several ways that teachers were given more formalised opportunities to learn more about the use of their laptops and ICT: formal professional development, fostering a culture for laptop use, and support from a designated ICT teacher.

1. Formal laptop-based professional development

Formal professional development involved individual participation in formal laptop or ICT professional development conducted by an 'expert', where teachers attended regardless of their individual expertise or current need for the knowledge. This was more of a 'just-in-case' type of professional learning opportunity. In the final year of each level of evaluation, nearly three quarters of teachers (Y9-13: 61%; Y7-8: 61%; Y4-6: 70%; Y1-3: 74%) had received formal laptop-based professional development. Given that formal professional development most likely required the support and or sanction of the principal, these figures are presented here as indicative of school-wide support for professional development. Although there was a growing participation in and presumably provision of formal professional development opportunities in the use of the laptop for teaching, for support or ideas for classroom use, use of specific software programmes, and developing resources, predominantly at the primary levels, by the end of the evaluation period just a quarter of secondary teachers and between a quarter and a half of primary teachers had experienced professional development of this nature (Y9-13: 24%; Y7-8: 26%; Y4-6: 50%; Y1-3: 48%). How to use the laptop/ICT for teaching and learning remained the main goal for development of teachers at all levels (Y9-1: 30%; Y7-8: 46%; Y4-6: 59%; Y1-3: 57%).

Although teachers appreciated school-wide/organised professional development, generic professional development was said to lack immediacy and personal relevance. Furthermore, some focus group teachers noted, and the questionnaire responses indicated, that much of the available professional development was targeted to the needs of beginning users. It was, however, seen as beneficial for tasks such as reporting and data entry where a uniform approach was needed. When asked what was the most useful aspect of laptop-based professional development many teachers felt that it was best if there was a hands-on component to the learning, and that to become proficient it was necessary to practice.

> *This helped to motivate me to use web-based programmes, however, I still do not feel confident. I need to use them more and have ongoing support.*
> *(Y1-3 teacher, 2008)*

2. Fostering and supporting a culture for laptop use

Teachers in each component of the study identified peer mentoring and collegial support as the main mechanism for enhancing their use of the laptops for teaching and learning. Primary teachers, in particular, considered that the benefits from peer mentoring were optimised when the whole school focused on ICT and/or laptop use. Typically, this meant that there was senior management support for laptop use. It sometimes meant teachers had access to time to learn during the school day. School leaders exercised by the principal, and a small group that included senior management representation and/or expert individuals, was considered important for fostering a culture for laptop use. In schools where leadership decides on a school-wide ICT focus, the school essentially becomes a learning community where teachers are supported to upskill in the use of ICT for

various tasks. Teachers from two secondary schools commented specifically that from their experience teachers' propensity to use their laptops was influenced by proactive leadership in developing a "laptop culture" in the school, which usually included fully funding teachers' lease of the laptops and an expectation that teachers would use the laptops in their daily work. There was often a long-term commitment by the schools towards ICT. Evidence of the benefits of long-term, school-wide, commitment to the development of staff ICT expertise came from one school where teachers had been involved in regular and varying forms of professional development since before they joined the TELA scheme:

> *Before the laptop scheme came out, four years ago there was intensive training right across the school with Unitec and every staff member had to attend for a term two hrs/week after school. I don't know how we got away with it but we did, so to a degree our 40 hours was kind of covered before we got there. When you do that course, you don't know how much that psychologically prepared you, but having been on that program I'd say what we do now is way more effective than that was. (Year 9-13 teacher)*

The next comment came from a young second-year teacher in a primary school where there was a focus on ICT development:

> *PD time is allocated during the year to each teacher who sets goals in ICT – work with IT leader, set goals for ICT use, we are expected to progress (ICT committee expectation). PD needs to be 'just in time' – we use a mentor on staff at the time. If someone is shown a new piece of software and doesn't use it they forget and have the issue later on they won't know how to use it. We try to get someone in to sit with a staff member to do something in their class. Being on the ICT committee, I have to work with my syndicate on this. (Y2 focus group teacher, 2008)*

In some schools there were expectations within a school for the preparation of electronic materials – student reports, student data recording and analysis, student absence recording, and unit and lesson planning and preparation. In these situations there was evidence that teachers found school leaders to be more supportive and that teachers used laptops more frequently and for longer periods. One rural focus group school principal said that he wanted the school to have shared expectations that the staff would "buy into". He realised that they needed to see him modelling the use of a laptop, and also to get out and see other what benefits other teachers were gaining from the use of laptops. Whole-staff professional development was often organised by the school in a more formal way to prepare teachers for meeting these expectations consistently. There were after-school meetings to discuss and model activities such as use of the school management system, electronic data entry, or report writing using a template. This was also seen as having some value for skill development. Where school leaders had set an expectation for laptop use for administrative tasks such as reporting, teachers had gradually realised the value of digital reporting.

> *It was up to teachers whether they went the digital way and most of them have, because once they started to see the digital reports, that phased in over the last three years, they liked them and wanted to do them this way. (Y7-8 focus group comment, 2006)*

Individual teachers who had innovated with their laptop/ICT use and or who had attended a professional development day or a conference were often asked to share their learning with others at staff or department/ syndicate meetings. Some schools ran breakfast meetings for this. These were voluntary, but teachers reported that they were well attended and valued.

> *After an area lead teacher ICT meeting, I just say, "This is what we learnt last time, this is what we set up." If people want information, they come to see me individually. So you do PD back at school with it. (Y1-3 focus group comment, 2008)*

One of the Year 4 to 6 focus groups discussed the challenges of sharing ideas on ways of using laptops or what they had learned at a professional development day, when there was no formal mechanism for this to happen. The suggestion was that sometimes colleagues thought that the returning teacher was presumptuous in trying to tell colleagues what to do.

3. Support from a designated ICT teacher

In many schools there was a designated ICT lead teacher, whose role included upskilling other teachers, helping staff to use new software, and even sometimes to be a technical expert and see to any minor repairs. By the end of the three-year evaluation period, around three fifths of teachers reported the ICT lead teacher to be a very supportive mentor (Y9-13: 68%; Y7-8: 56%; Y4-6: 59%; Y1-3: 59%). Two thirds of secondary questionnaire respondents had found the school ICT staff to be very helpful. This figure was lower for primary respondents (58%), and was not consistent with reports about whether or not schools had an ICT specialist (Y9-13: 55%; Y7-8: 75%; Y4-6: 75%; Y1-3: 74%). These figures may seem contradictory, but the ICT HOD in a secondary school is a formal position often located within an ICT department. By comparison the ICT lead teacher label in a primary school, although a designated position, does not necessarily mean that the person has an ICT qualification or is given any release time to carry out the expected duties. More likely than not, the person will be a full-time classroom teacher. The comments received from teachers participating in the evaluation indicated that this teacher did not necessarily receive support from the school regarding release time to help other teachers or, indeed, the opportunity to keep themselves up to date. Although designated ICT leaders who were lone specialists within a school were often part of an active email network with others, it was evident that these more advanced users also needed opportunities to extend their knowledge and expertise. It would seem that if school leaders do not recognise the value of this "in-house expert", burnout could result.

> *The ICT leader suddenly decided over the holidays that she didn't want to do it, so she's had all the knowledge but now she is not telling us what has gone on before and needs to be done. I think some of this was to do with the fact that she was doing a lot of it in her own time and she wasn't getting any release to do it. [This teacher had gained an ICT qualification while working in this role, and her unfulfilled goal had been to get some release time for ICT leadership in the school.] (Y1-3 focus group comment)*

As well as an officially designated ICT lead teacher, it seemed that all teachers in a particular school were aware of which colleagues had expertise in the use of ICT. These teachers were approached for help on an informal and ad hoc basis. Those teachers in the focus groups who had such expertise discussed the time commitment this involved. Colleagues indicated that

they were very aware of the demands placed on these teachers, but neither group were able to suggest a solution to this problem. Both groups acknowledged that schools might not necessarily have the funds to employ a designated ICT support specialist. Young teachers who have always used ICT and family members who have expertise in either the use of laptops or who offer technical expertise were a part of this group. There was some indication - particularly from focus group teachers at the primary level in rural areas - that there was considerable responsibility placed on these people in schools, with very little (if any) resourcing available to them.

> *I am kind of supposed to be the junior coordinator and there is a senior one as well. But the senior one who has some computer skills is not really that savvy – so everyone comes to me. There are no units and I do not have the time to run around. If you had some time to go and do it – I feel that I have not really done very much this year in the way of ICT because I have not had the time to get to know what it is that am supposed to do. (Second year teacher, Y1-3 focus group 2008)*

A process whereby schools cluster together to share problems and solutions

Teachers from different schools came together for professional development (PD), particularly under the ICT PD Schools Cluster Programme, to share ideas and laptop practice. School clusters could be driven then by policy that was sustained by teachers making a decision to continue the collaboration.

1. Cluster grouping for ICT development

In New Zealand, many schools are small and so the possibilities for collaboration were enhanced when schools clustered together to share 'what works' and to explore innovative ways to solve problems. Those primary teachers who had been in an ICT PD Schools Cluster group appreciated the support of the ICT PD facilitator, liked the hands-on practical ideas, and had used the laptop to collaborate with teachers from other schools. Some had continued to do this with teachers in their syndicate. One of these teachers felt that this ICT PD contract had "raised the profile of ICT in schools and the amount of support provided."

> *The ideas that we shared as a cluster providing motivation, and resources to use in everyday classroom situations. Hands-on practical ideas helped a lot. Becoming more aware of programs out there. (Y4-6 teacher, 2007)*

Secondary schools sometimes joined an ICT PD cluster subsequent to staff accessing TELA laptops. One teacher strongly advocated this as a means to increase teacher expertise, and as a way to address other concerns such as to avoid every teacher "re-inventing the wheel" in resources/PowerPoint development. Over the period of the study more and more of the participating schools were involved, or had been involved, in an ICT PD cluster. Teacher commentary on the value of this was very positive. One group of Year 1 to 3 focus group teachers who had participated in the ICT PD contract reflected that initially they had no choice but to become computer literate. By the third year of the evaluation they appreciated their participation, and were continuing to be involved in professional learning pursuits. Many teachers were wanting to take the "next steps" in ICT development such as troubleshooting, downloading programmes, everything a technical expert would do, or to learn "what other tools are out there and how they might be applicable for me and my teaching – how I can make movies, podcasting and things that are out there that were not there four years ago."

2. Other policy-driven clustering

In a similar way that the model for the ICTPD Schools Cluster Programme promotes teachers from different schools getting together, ICT plays a role in other government initiatives such as Numeracy, Literacy, and Assessment to Learn (AtoL). Teachers here are encouraged to collect, analyse and act on student achievement data as part of the teaching and learning process.

> *The Literacy Contract asks us to collect and analyse data. There are two of us that go off to our literacy day. There is the Year 3-4 teacher who will take her laptop and use it to take notes and bring up any school statistics that we might be needing to discuss – the reading recovery scores, the AsTTle stanines, etc. (Y1-3 focus group comment, 2008)*

Such policy initiatives can influence the clustering of schools to either share expertise in a certain area or to meet together with an expert who leads teachers from all the cluster schools in a new learning opportunity.

3. Sustaining ICT development through clustering

After a three-year ICT PD Schools Cluster Programme had been completed by cluster schools, some schools were able to keep the alliance going by clustering together to retain the expertise of the facilitator, if the facilitator was free to continue and money could be found for her/his salary. Rural primary focus group participants reported how the ICT PD cluster facilitator was kept on by several schools after the contract had finished. The facilitator would call in to each school on a regular basis to continue staff development in areas of self-identified need. One secondary school-maintained development begun in the ICT PD cluster through providing weekend workshops and an induction programme for new teachers:

> *New staff coming in get a half-day training session and when they come to do reports, they get training just before they do reports. Just-in-time training [is] run by the school and some of it [is] combined with the cluster. (Year 9-13 teacher)*

Summary And Implications

The TELA evaluation found that teachers need time to explore the use of laptops and ICT in their professional lives and that individuals at all levels of expertise and all levels of the school – classroom teachers, subject department/syndicate leaders, senior management and school boards – can benefit from opportunities to extend their knowledge and expertise. A key message pervading the findings related to the benefits gained from teachers having opportunities to share ideas and approaches with colleagues within the same school. Peer mentoring provides teachers with help and support that is specific to their needs, and peers are usually on hand for ongoing help. Clusters of schools, or subject departments in different schools, provided one means for this to happen. Things have shifted towards getting together in informal learning communities, but this has to be supported by leadership, time, and other resourcing. Recommendations for practice include:

The need for ongoing professional learning opportunities

Over the three-year period of each evaluation cycle, at all levels of the evaluation, there was a change in the focus of the professional development sought and received by teachers. As teachers became proficient in ICT use for lesson planning, reporting and student data management they turned their focus to its use for teaching and learning. Teachers became familiar with resources through continued use, but they still considered that there was more to learn to get the most out of a resource. Teachers noted that every year there were new developments in educational ICT - either a new application or a completely new type of peripheral - so there was always something new to learn about. Teacher commentary suggests the need for professional learning opportunities does not diminish over time because the emphasis shifts. This situation opens a range of challenges for school leaders to think about, in terms of how they might provide opportunities for continuing, and motivate teachers to continue, learning.

The importance of a school culture for collaboration

Teacher development opportunities are influenced by internal factors in a school, such as the culture for collaboration and change, and school leaders' support for the use of ICTs. Principals can play an important role in developing mechanisms and in allocating time for teachers to collaborate and share best practice. So too can colleagues by providing timely and relevant advice and follow-up support. Given the evolutionary nature of ICT and its possible uses, it seems likely that opportunities to share will continue to be important.

The need for all stakeholders to have opportunities to learn

Schools are advised to provide opportunities for on-site 'experts' and lead teachers to extend their expertise, including their expertise in mentoring and working with colleagues. Teacher aides, Resource Teachers of Learning and Behaviour, and other professionals within a school need to have opportunities to for professional learning. Boards of trustees and principals could be encouraged to seek out ongoing learning opportunities as well. Principals and teachers need to take the responsibility to ask for and to offer advice as professional development programmes such as ICT PD clusters come to an end, if progress is to be sustained.

The need to explore the relationship between teaching, the technology, and learning

Teacher commentary indicated that the facility to use the laptops/ICT for communication and collaboration, and for accessing material, information, and services via the Internet, was becoming more common, to the extent that those without the requisite expertise were likely to be excluded from the broad range of these activities. Given that TELA teachers remain quite focused in their desire to learn more about the potential of the laptop to help them in their classroom teaching, it would seem appropriate that professional learning opportunities include a focus on the pathways to pedagogical change. These opportunities could usefully include time for self-directed professional development and for working with more proficient peers. Easy access to models for teaching students using ICT would seem to be essential. This would have the additional benefit of supporting the development of schools as learning communities. A focus for development could be the understanding and development of new kinds of relationships between learning and teaching and the technology.

The need to promote getting together to learn more about ICT

Teachers and schools have responded positively to the provision of laptops for their personal use. At this time they are keen to explore the use of their laptop/ICTs for teaching and learning, which suggests a high level of support for e-learning practices such as those included in the New Zealand Curriculum (Ministry of Education, 2007). The findings of the TELA evaluation indicate that this can be achieved through a combination of individual, group (syndicate/department/collegial), school and school cluster professional development opportunities that contribute to a culture of collaboration around the use of ICTs.

Ann Harlow is a research officer at the Wilf Malcolm Institute of Educational Research in the School of Education at the University of Waikato. E-mail: aharlow@waikato.ac.nz

Bronwen Cowie is Associate Professor and Director of the Wilf Malcolm Institute of Educational Research in the School of Education at the University of Waikato. E-mail: bcowie@waikato.ac.nz

References

Cowie, B., Jones, A., Harlow, A., McGee, C., Cooper, B., Miller, T., Gardiner, B., & Maguire, M. (2007a). TELA: Laptops for teachers evaluation. Final report Year 9-13. February 2007. University of Waikato, Hamilton, New Zealand. Published by the Ministry of Education, June 2008. Available at: http://www.educationcounts.govt.nz/publications/ict

Cowie, B., Jones, A., Harlow, A., Forret, M., & Miller, T. (2007b). TELA: Laptops for teachers evaluation. Final report Year 7&8. February 2007. University of Waikato, Hamilton, New Zealand. Published by the Ministry of Education, June 2008. Available at: http://www.educationcounts.govt.nz/publications/ict

Cunningham, M., Kerr, K., McEune, R., Smith, P., and Harris, S. (2003). Laptops for Teachers: An evaluation of the first year of the initiative. ICT in School Research and Evaluation Series No 19. Becta/DfES. London: DfES Publications

Fisher, T., Higgins, C., Loveless, A. (2006). Teachers learning with digital technologies: A review of research and projects. Report 14, Futurelab Series.

Levin, T. & Wadmany R. (2005) Changes in educational beliefs and classroom practices of teachers and students in rich technology-based classrooms, Technology, Pedagogy and Education, 14(3), 281–307.

Ministry of Education. (2007). The New Zealand Curriculum for English-medium teaching and learning in years 1-13. Wellington: Learning Media.

Putnam, R., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning. Educational Researcher, 29(1), 4-15.

Senge, P. (1994). The fifth discipline: The art and practice of the learning organization. Milsons Point, NSW: Random House.

Webb, I., Robertson, M. & Fluck, A. (2005). ICT professional learning: towards communities of practice, Journal of In-service Education, 31(4), 617-633.

Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. (2002). Conditions for classroom technology innovations: Executive summary. Teachers College Record, 104(3), 482-515.

Zhao, Y. and Frank, K. (2003). Factors affecting technology uses in schools: An ecological perspective. American Educational Research Journal, 40(4), 807-840.