

Leadership and Learning with ICT

Kathryn Moyle (PhD)
Associate Professor
University of Canberra
Canberra, Australia 2600
kathryn.moyle@canberra.edu.au
Work Ph: (international code) +61 2 62015649

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Introduction

'Leadership matters' and 'start with the pedagogies, not the technologies', say Australian educators.

In 2005, the Australian government-funded agency *Teaching Australia: Australian Institute for Teaching and School Leadership* sponsored the *Leadership and Learning with information and communication technologies (ICT)* national research project. This national research is the first in Australia that has directly investigated the relationships between school leadership and learning with ICT. The aim of the research was to develop deeper, more specific knowledge about the nature of educational leadership required in Australia for the integration of ICT into teaching and learning. The project set out to investigate 'how does educational leadership support learning with ICT in Australian schools?' The objectives of the research were to identify, document and analyse school-based models of leadership which support teachers' professional learning and enable decision-making about ICT diffusion in schools. The research was undertaken to inform considerations about policies and programs concerning school leadership standards, teacher education and to determine professional development activities that support leaders' professional learning about integrating ICT into teaching and learning. The outcomes from the *Leadership and Learning with ICT* research project has provided insights into what over 400 of Australia's educational leaders saw in 2005 as factors that contribute to how leadership supports students' learning with ICT.

Rationale

In Australia, there is now widespread policy and community expectations that school leaders in the 21st century must be able to build the capacity of their school communities where contemporary learning theories and practices include ICT. The Australian Government and the respective governments of the states and territories have made considerable investments into information technology (IT) infrastructures; professional development; reviews of teacher education and on policy statements and frameworks.

In Australia, there are overlapping and interwoven themes in commonwealth, national, state and territory policies, and Australia's policies share similarities with comparable policies in the United States (US) and United Kingdom (UK). School education policies in each of these countries indicate one of the reasons for including ICT into teaching and learning, is to improve students' learning outcomes. Related to this purpose are the aims of increasing the personalisation of teaching and learning,

raising standards, improving workforce capacity and supporting students to achieve to their full potential. Absent from much of the policy discourse about the relationships between ICT and student learning outcomes however, is a problematizing of the government policy agendas which seem to be focusing upon accountability issues as a major reason for asserting that ICT improves student learning outcomes. Yet in the 21st century it can be argued that students' ability to include technologies as part of their learning is as fundamental now, as including pens, paper and books were in the 20th century. A complexity for schools is that these 'old technologies' continue to remain current in the 21st century, while 'new technologies' are also being added.

Design of the study

The *Leadership and Learning with ICT* research brought together the broad fields of 'leadership' and 'teaching and learning with ICT'. A rich body of literature has been building over the past two decades about educational leadership in schools, but there is considerably less that specifically addresses leadership that supports the integration of ICT into teaching and learning.

Integrating ICT into teaching and learning represents a major whole school reform. Successful whole school change requires the vision and leadership from people within formal school leadership positions. School leadership is also recognised as a critical factor in students achieving success at school. To date, leadership in the integration of ICT into school classrooms has been undertaken by a range of personnel: some with the authority of positional leadership and also by 'teacher-leaders' (Downes, Fluck, Gibbons, Leonard, Matthews, Oliver, Vickers & Williams 2001). As the complexity and sophistication of computer hardware, software packages, connectivity and networking issues increase however, there is a growing requirement for educational leaders and administrators to understand the implications of selecting and deploying ICT solutions, as these technologies impact upon and present issues for the whole school community.

Over the past two decades ICT Australian education policies have promoted the importance of professional learning in raising the capacity of teachers. Most professional learning concerning ICT by teachers is undertaken at school, which points to the importance of having school leaders well-versed in current theories and practices about the place of ICT in teaching and learning. At the same time though, the professional development organised systemically for school leaders has tended not to attend to their specific professional ICT learning requirements. Approaches specifically designed to improve the workplace ICT capacity of school leaders are therefore important to investigate to see what strategies may be applicable to Australian educators.

Conversations in education research

To reflect the dynamic and inherently social and cultural nature of schooling, this research adopted the theoretical complexity offered through the use of social and interpretative research approaches (Lagemann & Shulman 1999). This national research project was informed by qualitative research methods drawing on interpretative and narrative theories (Herda 1999). This project recognised that the meanings people give to their situations and experiences can be learnt through the stories told and the interpretations given to such circumstances (Bruner 1986). These interpretations can be gained through professional conversations such as those conducted in the focus groups used in this study (Denzin, & Lincoln 2000).

Conversation is a basic form of human interaction (Kvale 1996), and one of the ways stories are told is through conversations; they are speech events where the

purpose is focused upon the notion of transaction or exchange (cf Bruner 1986; Mishler 1993). This is to highlight that conversations as speech acts occur in social contexts. Transactions carried out in conversations then are premised upon mutual assumptions about how the communication should be undertaken (Bruner 1986; Mishler 1993). That is, in conversations we each orient our language to the interpretative contexts within which we find ourselves and construct the language we use, to fit those contexts. 'Research conversations' (Herda 1999) then, were considered here as the 'construction sites' (Kvale 1996) for research data.

Data collection

The data collection focussed upon the relationships between school leadership and the integration of ICT into teaching and learning. School-based leadership practices that support teachers' professional learning and enable decision-making about the use of ICT in schools and their impact on students' learning, were identified. The role of both pre-service and post graduate teacher education were questioned.

Data for this research was collected through focus groups conducted in all capital cities in Australia. Over 400 people participated in the research. Participants included school leaders, administrators, ICT leaders, teachers, parents, teacher educators and officers from regional and central departments of education.

The proprietary software *Zing* was used to collect the data. *Zing* enables 12 or more keyboards to be plugged into one portable computer and for the cursors of each of these remote keyboards and the portable computer to all be able to type on the same screen within individualised spaces. With the assistance of a data projector and a large screen, all participants were able to see what each other was typing while anonymity was maintained.

The focus groups were conducted using a process of 'talk, type, read, review'. Each group was posed questions relating to leadership and learning with ICT. Participants were encouraged to talk in small groups of two or three in order to think about their responses and clarify their thoughts. When they were ready, participants were then encouraged to record their responses using their respective keyboards. Once each person's responses were recorded, then as a group, the responses were read aloud so that everyone in the group had the chance to review others' responses. Themes that emerged from the reading and reviewing of the responses were then recorded. The use of *Zing* enabled all participants to have an equal voice in the provision of their responses.

Using *Zing* enabled the data to be recorded directly from the participant into the computer without the intermediary step of transcription, so often required in qualitative research. The software also enabled formatted transcripts of the session to be generated directly from the data, and so all participants, received the transcript for their particular session as a record of their participation in the focus group. Participants indicated that they enjoyed the process and felt they got something from it for themselves as well as contributing data to a national research project.

The data collected was analysed to identify and analyse common emerging themes in response to the focus group questions presented.

Themes

Several themes emerged from the data. Investigating the integration of ICT into teaching and learning provided a complex prism through which to view how different leadership styles can be applied.

Participants identified seven inter-connected conditions as necessary for supporting teaching and learning with ICT:

1. Strategic plan;
2. Vision;
3. School culture;
4. Whole school approach;
5. School infrastructure;
6. Organizational structures; and
7. Teacher education and leaders' professional learning

Strategic plan

Participants stressed the importance of whole school planning in order to incorporate ICT into teaching and learning. Many schools around Australia have ICT strategic plans. Some participants indicated that ICT strategic plans have a shelf life of between 18 months and 3 years before they do not match the technological realities of the school and they therefore require regular revision, monitoring and updating. Several participants indicated however, that incorporating ICT into teaching and learning should be a part of a whole school plan rather than the subject of a separate plan.

Typically a school's strategic plan includes a vision, goals or objectives, and strategies to meet that vision and goals. Whole school strategic plans tend to incrementally approach the outcomes identified in the vision section of the plan. Participants also indicated that the goal of incorporating ICT into teaching and learning should be able to be tracked through documents such as a school's *Annual Operating Plan*, the school's *Strategic Plan*, *Budget*, *School Reviews* and *Annual Reports*. School review processes were proposed by some as a mechanism by which ICT targets could be set so that ICT in teaching and learning is embedded into planning and review processes at a strategic level and from a school perspective.

Vision

Linking vision statements to strategic plans was identified as an important step to incorporating ICT into teaching and learning. Participants indicated that concise vision statements to which the whole school community agreed were necessary if ICT were to be successfully integrated into teaching and learning.

Vision statements focus on the future. They serve as a foundation for establishing the directions of a school. Vision statements were identified in the focus groups as important for leading to the development of specific strategic plans. Participants indicated that the visions articulated and agreed to by the school community had to lead to action, not just sit on a shelf in the principal's office or the staff room. Participants also reiterated that visions and the strategic plans require regular reviewing if they are to remain pertinent to the school community and to check that their scope and sequence are achievable. The following was provided by a participant as an example of a school vision statement that incorporates ICT.

The vision for student learning at Our School is the creation of authentic and collaborative learning environments where students can motivate themselves and each other to become self-sufficient, lifelong learners, able to utilize the opportunities provided by a wide range of technologies, including the Internet.

Figure 1: Example of a school vision statement that incorporates ICT

Participants identified the following characteristics of a school sharing a common vision:

- The school community has been involved in the development of the vision;
- The vision is focused on requirements of the school community;
- Staff in the school are able to articulate the vision and demonstrate a commitment to it;
- Staff have a shared knowledge about the vision of the school;
- There is the use of a shared language about the vision;
- Organisational purpose is evident in the work of all staff;
- The vision is regularly articulated and refined in conversations; and
- The vision leads to a strategic plan that is appropriate for taking action and making progress.

The necessity for visionary leaders to accompany visionary plans, was identified by participants in the research as important in schools. They indicated that leaders with the ability to see potential future scenarios and who can lead people to achieve that future, are required in schools. The challenge for school leaders however, is to be able to paint a concrete picture or a scenario for the future, in which others can see themselves, and to which they can commit. Leaders then, need to be able to provide a vision of the future that is inspirational and challenging for staff and students.

Participants also indicated that they wanted schools visions for incorporating ICT into teaching and learning to be supported by systemic visions and plans. Some participants indicated that at a systemic level an improved educational match between policy developers, technical experts and the curriculum people is required. In addition, they indicated that the synergies people could generate at a system level, should flow through to schools. Where regional and state offices do not have an articulated vision and plan that supports their ICT work in schools, or where such plans are at odds with the realities of schools, participants indicated they tended to give these offices limited credibility.

School culture

Participants described school cultures that support teaching and learning with ICT, as being flexible places where risk taking is encouraged, and where the culture of the school inspires teachers to 'have a go'. The school culture can be considered to be the 'atmosphere' of the school which is based around its' own combination of values, beliefs and priorities.

Participants indicated that school leaders, and especially the principal are important in setting the culture of the school. Leadership that has a shared sense of purpose and is clearly supportive of ICT is required to support the fostering, maintenance and development of a school culture that enables the integration of ICT into teaching and learning. Many participants indicated that where ICT are infused across the school, technologies are seen as integral parts of the curriculum and are incorporated into the overall culture of the organisation. Participants indicated that such a school culture requires leaders and teachers who see ICT as integrated, not separated from the curriculum.

Participants described several indicators that demonstrate a school culture which values the integration of ICT into teaching and learning. These indicators included:

- Members across the school community being able to articulate why ICT is important for the school community (ie students, parents, staff);
- There is an expectation across the school that all teachers will embed ICT across the curriculum;

- Innovation and risk-taking are valued and encouraged;
- A culture of inquiry is fostered, underpinned with processes of reflection, conversations and action;
- Learning to learn strategies are used with all staff and students;
- There is a lack of fear of failure in staff and students;
- The school has a focus on teacher education and professional learning of all staff;
- Professional learning is varied according to the different requirements of the respective staff members;
- The student outcomes to be achieved are examined, and appropriate technologies are included in the teaching and learning to enable students to achieve their learning outcomes;
- A culture of collaboration and cooperation exists where it is acceptable to challenge existing paradigms and structures;
- There is an environment of respect and trust;
- Professional conversations occur incidentally and formally about ICT and students learning; and
- A lifelong learning approach is evident across the whole school community.

One participant described as follows how a school culture can translate into the way teachers and students interact:

Students integrate various kinds of technology into their work ie mobile phones, digital cameras and video; teachers encourage students to share their knowledge with all; teachers allow students to take risks with technology and learning within a safe environment; and students know how to use technology ethically.

Participants indicated that the attributes of school leaders were important factors contributing to the school culture. Attributes identified as important for school leaders included:

- Being visionary, inspirational, creative, and adaptable risk takers;
- Being competent with incorporating ICT into their work;
- Understanding of the complexities of the work;
- Understanding the implications of ICT diffusion for decision-making;
- Encouraging peer learning among staff and students;
- Enabling structures that foster sharing of ideas across the school;
- Facilitating collaboration;
- Sharing information and knowledge; and
- Being able to generate opportunities.

They also indicated that achieving the sort of school culture outlined here, requires having a futuristic vision about including ICT in teaching and learning, which is shared across the school community.

Whole school approach

Participants talked about the integration of ICT into teaching and learning requiring an holistic approach by leaders both within schools and school systems. They indicated that those schools with a clear, holistic 'whole school' strategic focus on teaching, learning and organisational improvement are likely to be well placed to integrate ICT into their teaching and learning. They also highlighted the necessity for ICT to be incorporated into the full range of a school's operations. They commented that employing ICT to support learning must be seen as a natural part of school processes.

Participants described characteristics of a whole school approach to integrating ICT.

Their descriptions included the following. The school:

- Has a vision, well understood planning processes, access to technologies in all classrooms, time allocation for teachers professional learning, technical support, an ICT committee, budget allocation including an allocation for professional learning for staff, an ICT replacement schedule, an intranet with 'help' facilities, up to date software, and educational and technical support for classes to trial and develop learning with technologies;
- Provides strategic thinking opportunities for all members of the school community which includes getting the whole school community engaging with ICT;
- Includes technology issues as parts of other committee agendas;
- Ensures there is a multi-faceted approach to in-school processes aimed at supporting ICT in teaching and learning including:
 - budgets for ICT;
 - staff meetings conducted around ICT issues;
 - professional development and teacher education activities held to address issues pertaining to learning with ICT;
 - processes ensuring equity of access to the technologies for the whole school community (eg class sets of computers);
 - in-school curriculum planning processes which are well understood and include the integration of ICT;
 - technology-rich tasks embedded into students learning outcomes;
 - technical support officers and 'help' strategies;
 - understood mechanisms for sharing information on interesting websites among staff;
 - in-school research and development strategies to inform teaching and learning approaches; and
 - monitoring, review and evaluation strategies in place.

Taking a whole school approach to integrating ICT into teaching and learning then, was seen to require consideration of physical, pedagogical, philosophical and practical issues in an integrated way, across the whole school, where professional learning and in-school processes get regularly reviewed and revisited.

Budget considerations were consistently raised as central to supporting the inclusion of ICT into teaching and learning. Budgets for ICT vary across schools in Australia, depending on the size and wealth of the school. Participants indicated that sufficient resourcing of ICT and enabling programs for ICT by the school leadership gives a clear message of the value by the school to integrating ICT into teaching and learning and gives encouragement to students.

An important intersection however, was identified between local school management and the integration of ICT into teaching and learning. Tensions were highlighted in this research between schools and external systems or national responsibilities in relation to policy boundaries, funding responsibilities and the degree of centralization of school systems. School education in Australia is now largely organized around concepts of self-managing schools or local site management (Calwell 2004). While local school management in the government sector has only emerged strongly in Australia in the last decade, many non-government schools have always been locally managed or self-managing schools. Devolution to the local level in the government sector has generally involved schools taking on responsibilities previously held centrally. The general 'flavour' of this local school management involves government schools and the school's governing council managing their own budgets within

externally determined priorities for curriculum, infrastructure and other expenditures. This means that in the government sector, the relationships between budgets, ICT provision, external policies and local school management butt up against each other.

The role of school leaders was raised in relation to budgets. The following proposals were made:

- Leaders must have a commitment to allocating resources to ICT;
- Leaders need to have a vision which guides their decisions in ICT budgets, yet maintains the standards in all areas of the curriculum;
and
- Leaders must establish recurrent financial models that underpin sustainable budget approaches for schools IT infrastructure.

School infrastructure

The ICT infrastructure of schools usually includes the hardware, software, Internet services, networking and connectivity requirements necessary for the teaching, learning and administration of schools. Sufficient infrastructure was identified as a pre-requisite for including ICT in teaching and learning. Participants indicated that schools are changing as they incorporate ICT into aspects of their work. Some of the most obvious signs of change were reported as being seen in the physical and infrastructure changes occurring in schools. Relationships between teaching and learning and the physical design of classrooms and schools were regularly raised in the focus groups. The role of school leaders including school principals in leading, managing and supporting change was reiterated by participants.

Remote access to the school's intranet was seen as important for making education available on a 24 hours, 7 days a week basis. Teaching and learning supported with access to intranets to support collaboration and communication were discussed and it was consistently emphasised in the focus groups that the nature of the teaching and learning should drive the ICT network not the network drive the teaching and learning.

Participants emphasized the importance of ensuring the school's ICT infrastructure is secure, robust and reliable, suggesting that only one or a few negative or frustrating experiences lead staff to believe that incorporating ICT into teaching and learning is more problematic than helpful. Participants indicated that students require access to a variety of technologies, with some participants suggesting schools should have a mix of laboratories, pods, in-class computers, wireless technologies, laptops, and other portable technologies. Several participants indicated that peripherals such as digital cameras and video cameras, scanners, and handheld devices also form an important part of teaching and learning with ICT. How these technologies are deployed in schools was seen by participants as an embodiment of what sorts of teaching and learning school communities value.

Establishing sustainable structures of a school to enable a culture of inquiry accompanied with an IT backbone, where pedagogy drives organisational decisions including the deployment of ICT however, was recognised by participants as a complex task: one that for many schools represents significant organisational change. Paradoxes for principals having to balance the legislative requirements of students physically attending school with the emerging capacity of schools to provide students with '24x7' access through the school intranet and online learning courses and resources, were discussed.

Leadership was identified as having a key role to play in organisational change. Many participants talked about both leadership and change being shared endeavours

in schools. Principals were viewed as important as they can establish and foster decision-making processes to assist school communities make decisions based on the broader perspectives of the school's vision, strategic plan, and the organizational structures that include the school's ICT network or infrastructure. Participants indicated that one of the fundamental characteristics required of school principals in the 21st century is the capacity to initiate actions that lead to innovative change and that he or she motivates others into action so that the approach to change represents a shared leadership approach and enables school-wide learning. The way the principal goes about leading and managing change, and the types of organizational models and methods used, reflects the degree to which the leadership in the school, is indeed shared.

School structures and processes organise schools work. Participants indicated that creating flexible school organisational structures assisted the integration of ICT into teaching and learning. They referred to organisational structures and processes that support teaching and learning with ICT and others that create challenges.

Organisational structures identified as supporting teaching and learning with ICT included:

1. Team approaches to ICT leadership;
2. Relationships of schools staffing profiles to teaching and learning with ICT; and
3. Time and timetables.

Participants also indicated that while there are various aspects to leadership: such as contingent leadership, transformational leadership and political leadership, it is the ethical leadership that now requires further investigation. Ethical issues that participants identified as requiring consideration included:

- The ethical use by all members of the school community of materials posted on the Internet;
- Establishing policies and procedures for monitoring and addressing 'cyber-bullying' at school;
- Developing a deep understanding across the school community of the moral and ethical implications that arise from increased access to information;
- Understanding the ethical issues of information use, publication, intellectual property, identify management and identify protection;
- Protecting students identities while encouraging students to publish; and
- Developing understandings across the whole school community of what it is that is acceptable to post to email and online environments, that is cognisant of libel and slander laws, and to also understand the consequences of not respecting these laws, such as litigation.

Related to the discussions concerning the professional learning required to support the inclusion of ICT into teaching and learning, some participants also commented about the nature of preservice teacher education.

Teacher education and leaders professional learning

The role of the teacher in supporting students to learn with ICT was seen as an irreplaceable component of school students' learning. But some participants commented adversely about the nature of preservice teacher education. Some participants expressed concerns about the lack of opportunities in preservice teacher education qualifications for new teachers to include ICT in teaching and learning. Other participants indicated however, that they preferred to engage teachers in their first year of teaching because they could mould them, and that these new teachers tended to see the processes of change as an accepted part of school life.

Some participants pointed to strategies individual universities and their local schools are employing to improve the quality of teacher graduates, and to assist them to include ICT as a natural part of their teaching and learning. These strategies included regularly mentoring student teachers during their practicum; establishing a 'buddy-relationship' between schools and their local university to support teacher graduates in the first year of teaching; and running regular seminars for practicing and undergraduate teachers to attend. Other participants indicated that both undergraduate and post-graduate study opportunities and innovative approaches require documentation so they can be shared across universities and school jurisdictions.

An example provided of work linking schools and universities was the Australian national project *Partnerships in ICT Learning (PICTL)* being conducted jointly by the Australian Council of Computers in Education (ACCE) and the Australian Curriculum Studies Association (ACSA). The PICTL project is developing and documenting good practice approaches to embedding ICT throughout the educational experience of student-teachers, practising teachers and teacher educators.

Conclusion

The *Leadership and Learning with ICT* national project has provided several insights into what Australian school leaders saw in 2005 are the relationships between school leadership and learning with ICT. Using the *Zing* software with the 'talk, type, read, review' process enabled the collection of qualitative data from school leaders across Australia. The research showed that ICT is providing a lens through which to reconceptualize school education, where the value of ICT is seen as a part of students' suite of learning tools, rather than as a course to be taught in isolation to other subject matter. Matching the technologies with the pedagogies was identified as an important principle that should underpin teaching and learning with ICT. Several themes emerged from the research including the importance of school leadership to support teaching and learning with ICT. Teacher education and ongoing professional learning were identified as important components in an educator's career in order that their approaches to teaching and learning ensure students can meaningfully engage in learning with ICT.

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