

Refereed Conference Paper

This paper was accepted for the conference via a blind refereeing process established by the Conference Planning Committee on behalf of ALEA and AATE

Title

i-Kindy: Responding to home *technoliteracies* in the kindergarten classroom

Author(s)

Christine Edwards-Groves and Michaela Langley

Abstract

The paper brings together results of two comparative case studies conducted in a rural region in New South Wales Australia, and draws on interviews, student and teacher surveys and participant observations to form the empirical data set. All teachers in the study acknowledged that young people enter school with a repertoire of *technoliterate* practices, and they recognised the value of creating a new pedagogical landscape for interpreting and producing texts in kindergarten classrooms. However, for some of these teachers their belief about their own capacity in this field acted as a barrier for expanding their own repertoire of *technoliterate* practice (some even abandoned what they know about effective teaching in kindergarten). For others, school-based practices serve to constrain what was possible in kindergarten classrooms.

Utilising contemporary understandings of *multiliteracies* (Anstey & Bull, 2006; New London Group, 1996), this paper discusses two main areas: student home-school *technoliterate* practices and professional learning (as a group of *untechno-savvy* teachers responded to the challenges of integrating Information Communication Technology (ICT) in their kindergarten classrooms). In professional learning communities (Wenger, 1998), teachers in one case study project worked together to build understandings and develop practices, which created responsive learning spaces that, built on kindergarten student's repertoire of home *technoliterate* practices. The teachers firstly gathered and responded to assessment information; and secondly, they harnessed the notion of 'technology as text'; and thirdly through focused transformative dialogue and practical action they changed classroom practices. The 'Framework for the Pedagogy of Multiliteracies' [through the elements of

situated practice, overt instruction, critical framing and transformative action] (Cope & Kalantzis, 2000) served as a useful theoretical approach for the change process in the study.

Keywords

multiliteracies, technoliteracies, kindergarten, transformative action, transition

Author contact information

Christine Edwards-Groves
Lecturer Literacy Studies
School of Education
Charles Sturt University, Wagga Wagga
Australia
Ph. 0269332444
Fax 0269332888
cgroves@csu.edu.au

Michaela Langley
School of Education
Charles Sturt University, Wagga Wagga
Australia

i-Kindy: Responding to home *technoliteracies* in the kindergarten classroom

Introduction

It has long been argued that the contexture of classrooms in contemporary times requires classroom *practice architectures* (Kemmis & Grootenboer, 2008) to be technologised in ways that enable students to be flexible, creative thinkers and to learn within a culture of inquiry, discovery and creativity. Learning spaces are no longer bound by the four walls of the classroom as technologisation and globalisation have [potentially] enhanced learning and advanced the capacity of teachers and their students for interpreting, designing and producing multimodal texts. New *technoliterate* practices have reinvented 'text-interpreting' as a critically analytic activity and 'text-making' as a creative endeavour as print or written texts are no longer privileged in the modern classroom, creating distinctive social spaces for new activities *and* interactivities. These new social practices have enabled students to become multimodal designers of text from a young age as they *message, blog, flickr, utube, twitter* and *podcast* their way into their future.

The textual practices of today's youth demonstrate both creativity and technical complexity, reshaping traditional understandings of text analysis, meaning making and communication (Canole, De Laat, Dillon, & Darby, 2006). Student mastery of Information Communication Technology (ICT) needs to become a commitment by all educators in order to prepare students for an employable future education (Department of Education, Training and Youth Affairs, 2001; Freebody & Hornibrook, 2005; Johnson & Kress, 2003; The Ministerial Council for Education, Employment, Training and Youth Affairs, 2000, 2005b; Zammit & Downes,

2002). And although there is an increasing awareness by teachers of the use of new technologies and literacies (described in this paper as *technoliteracies*) and the effect that the use of these have on literacy and literacy education, the kinds of practical challenges and dilemmas facing many teachers constrain, and even, burden professional action. Some teachers fear losing control of content delivery (Goldman & Hocking, 1999). In the midst of a raft of research findings, administrative policies, professional development (PD) offerings along with a proliferation of available textual resources teachers find themselves remaining on shaky ground as they grapple with authentic and practical ways to 'actually' transform pedagogical practices in their own circumstances. How schools take their place in this landscape is the critical issue for this paper.

Home and community technoliterate practices

ICT is fast becoming more viable and highly visible in children's out-of-school social worlds (Downes, 2002; O'Hara, 2004; Pluss, 2007; Zevenbergen & Logan, 2008). Although some homes do not have access to technologies in their homes, in general, many Australian children do have access to a range of technologies including computers at home (Ainley & Enger, 2007; Australian Bureau of Statistics, 2006). In fact, the 2006 *Household use of information technology Australia 2005-06* study conducted by the [ABS], indicated that "92% of the 2.7 million children aged 5-14 used a computer and 65% used the Internet" (2006, p. 6). What this data does not do however, is specifically show the access and use of technology of young people entering school.

The phenomenon of the mobile milieu (with parents and family working away from the family home) has seen some children at a very young age develop a widening repertoire of *technoliterate* practices in order to communicate and interact with family for pleasure and for necessity. Young people learn to read and construct with a plethora of texts and technologies as they take, upload and print digital photos, read and write email, send and read text messages, load and navigate DVD's and ranging software, create Wii characters etc. Such prior to school ICT practices are a new social and cultural resource to be utilised in contemporary pedagogies and raise the question for this paper about how schools respond to the growing level of sophistication and development that many students bring to the primary school classroom.

School technoliterate practices

Policy, practice and professional learning are key areas for consideration in the discussion about school *technoliterate* practices. The integration of ICT into Australian schools has a lengthy antecedent within the political and educational genres of the past decades (National Office for the Information Economy [NOIE], 1998). Although many (if not all) schools have documentation providing a scope and sequence for learning and embedding ICT into the everyday learning in classrooms, an important issue remaining for teachers is the implementation of appropriate ICT educational practice conducive and responsive to student capabilities. Since, a teacher's own ICT experiences, expertise, pedagogical beliefs and

values play an integral part in shaping technology-mediated learning opportunities in classrooms and ultimately student performance (British Educational Communications & Technology Agency [BECTA], 2003), the question of teacher knowledge and practice requires focused attention. Additionally, much of the professional literature and research around ICT pedagogies and connecting student's out-of school technoliterate practices with in-school learning focus on older students (Dwyer, 2007). This is a main concern for Kindergarten teachers.

Many schools create practice architectures aiming to support the transition from home to school. For some, this involves 'transition days' where pre-schoolers come to school for a short period of time to familiarise them with the environment, the routines and the people. For others this includes semi-formal interviews aimed at gathering information about the child so that schools can adequately respond to individual need and capacity when the child arrives the following year. Transition interviews often seek to ascertain social skills along with early literacy and numeracy skills, but rarely *technoliterate* practices. Additionally, many teachers allocate time at the beginning of the Kindergarten year to gather information about student abilities and needs in early literacy and numeracy. Clearly a disparity exists between the acknowledgement of student prior to school literacy and numeracy learning and a disregard of the impact technology has on children's pre-school lives (Downes, 2002; Zevenbergen, 2007). Consequently, viewing technology use as literate practice requires a place on the school agenda.

The first year of schooling is a crucial period of learning for children as they begin their formal education; it is when students develop the skills, knowledge, values, attitudes and behaviours that are the foundations of lifelong learning (New South Wales DET, 2006). According to research (Amante, 2007; Downes, 2002; O'Hara, 2004; Pluss, 2007; Zevenbergen & Logan, 2008), young learners need their prior ICT knowledge and competence assessed and accessed in order to establish links with new experiences and make authentic connections between home and school practices. Past research concluded that irrespective of teaching, students are using a wide repertoire of technologies in a variety of often sophisticated, complex, and extensively communicative ways (Canole et al, 2006). Furthermore, Downes (2002) discusses how "the level of expertise gained by children from informal settings such as the home needs to be acknowledged in the school curriculum, in order to assist children to further their learning about computers" (p. 32). It seems a greater emphasis needs to be placed on actually purposefully investigating and making use of student prior ICT experiences to enhance teaching design in relevant and productive ways. More importantly, a lack of knowledge will limit responsive pedagogical action.

Professional technoliterate practices

Changing technologies require changing education practices. Schooling for the 21st Century requires new practice architectures be designed to meet the requirements of a "knowledge based economy" (OECD, 1996, p. 3) demanding schools retain currency and compatibility

with the new “knowledge era” (Warner, 2006, p. 21) in a way that overtly creates textual and technological bridges between home and school practices.

While much work by the Australian Government regarding policies and practices for ICT integration has transpired, there appears to be minimal direction for educators concerning its implementation with early learners (Li, 2006; Van Scoter, Yost 2003). This is evident in New South Wales Board of Studies syllabus documents and Foundation Statements for Early Stage One (1993; 1998a; 1998b; 1998c; 1999; 2002) for example, where limited outcomes for ICT learning across the Key Learning Areas are identified. It is even suggested that the New South Wales ICT curriculum requirements for kindergarten students appear terse (Dwyer, 2007). They focus primarily on written outcomes and contrary to empirical evidence suggesting the potential gains for early learners to use ICT for developing motor skills, creativity, critical thinking and problem solving (Haughland, 2000).

Pragmatic ways to support early years teachers advance pedagogical *technoliterate* practice is limited. In fact, the literature generally *encourages [rather than teaches]* teachers to re-examine current practices. Simply expecting teachers to integrate technology in authentic and learning centred ways is not sufficient, and perhaps even unrealistic, when holistic school-based approaches need to be implemented to assist teachers to create appropriate frameworks for ICT teaching to assist student learning.

Description of the context, participants and methodology

This paper draws on the results and findings of two *collective case studies* (Creswell, 2008). Both studies took place in the rural Riverina region of inland New South Wales. Teacher participants were drawn from eight primary schools and were all experienced teachers (teaching between 5 and 25 years) and volunteered for the project after being initially addressed about the research by school leaders within their specific location. The cases discussed in this paper are connected by the use of the *pictographic survey instrument*. The methodology for each will be presented separately.

Case One

Case Study One investigated Kindergarten student’s knowledge and experience of ICT, teacher perspectives and classroom practices in three kindergarten classes (involving 4 teachers) in a regional location in inland New South Wales. This particular study aimed to determine if and how kindergarten teachers gather and respond to information about student prior knowledge, and how they respond to the requirement for ICT integration in everyday teaching practice. Data involved a student survey developed as a *pictographic* instrument (a pictorial survey for kindergarten students designed by Langley, 2009), in-class observations, comprehensive field notes and teacher interviews (recorded and transcribed) conducted within the first few weeks after entering school. The *pictographic* instrument was designed as a visual tool with images depicting a range of technological devices that the students may have encountered in their homes and was designed to minimise the linguistic demands for the

young participants. It was developed as an age appropriate data collection tool suitable for surveying five and six year old children and was relatively quick to complete.

Students were asked to 'read' the visual images and identify the items they *had* at home (with a circle) and the items they had *used* at home (with a tick). (Note: examples of actual artefacts, large laminated photographs and detailed explanations were provided to complement the survey implementation). This was completed in a step-by-step process. Although this task was largely a visual literacy task, the implementation was supplemented with taking field notes reporting anecdotal comments students made throughout. Results were analysed qualitatively and supplemented with descriptive statistics identifying common themes across participants. Two of the 3 schools conducted ICT-related sessions in the designated school computer lab (of up to twenty two computers). The other classroom had 2 new desktops and access to a newly acquired bank of ten portable laptops.

Case Two

Case Study Two was an action research project involving twenty participants from 6 schools (of which 3 were kindergarten teachers; 2 were professional development facilitators and the researcher who acted as a mentor for the project). Each of the schools in this project had access to classroom based computers (between 2-15 computers); 3 of the schools mainly conducted ICT lessons in the computer labs. Case Two specifically investigated ways teachers transformed classroom practices through participation in professional learning communities aiming to support teachers adjust practice architectures in order to integrate ICT in their classrooms in meaningful and authentic ways (Note: this paper focuses on results from one kindergarten classroom from the broader study).

The elements of the *Framework for the Pedagogy of Multiliteracies* (Cope & Kalantzis, 2000) offered a useful approach for both the research and change process. This was overlaid with the notions of Wenger's Communities of Practice (1998) as a basis for professional learning by:

1. capitalising on the teachers own context, knowledge and experience relating to the teaching of literacy (Situated Practice);
2. building capacity through explicitly teaching some basic technical aspects of ICT and developing familiarity with the metalanguage of technology, design and multiliteracies (Overt Instruction);
3. rethinking and reinterpreting 'traditional' texts and the practice architectures using texts (e.g. within the literacy block) and relocating them within integrated 'rich' tasks; and analysing teaching and textual practices (including text design) (Critical Framing); and,
4. extending the professional self by locating new purposes and new creativities in their own contexts, and applying knowledge of design and new textual practices to 're'design practice architectures (Transformative Practical Action).

Results and discussion

Classroom observations, teacher interviews and surveys, field notes, student surveys and classroom artefacts are the primary source of data upon which this discussion is based. This section presents the findings under three broad categories: transition to school, school based practices and professional transformation. Results of the two cases are presented comparatively.

Transition to school practices

All schools in the study had a transition-to-school program, which included gathering data about the children coming to school; however, none collected specific data about children's home *technoliterate* practices.

Assessing student prior-to-school experiences

Results from the pictographic survey instrument (used in 3 contexts) indicated all kindergarten students in this research setting came to school with a variety of prior ICT knowledge and experience, a fact that teachers in the study only assumed. 85% of the sixty two students surveyed indicated ownership of a computer at home, 81% of the students indicated they also use the computer. Prior access and usage is highly relevant when considering the extent of computer-related experiences students bring to kindergarten. Percentages of identified access to computers in this study are comparable with the work of Zevenbergen and Logan (2008) who suggested that "many children are coming into early childhood settings with considerable experience of computers" (pg. 11). All students had different experiences with ICT. Anecdotal conversations with the kindergarten students throughout the observations and survey implementation demonstrated a familiarity with a wide range of ICT devices, although not all students had used all the devices listed on the survey. Most students could manipulate the tools of the technology hardware (DVD players, game stations, cameras, phones etc). Some students used a range of technological devices and programs to create text; they discussed sending email and text messages, taking and uploading digital photos, using a number of text creation programs and so on. One young girl talked about using a webcam to 'talk to daddy' who was in the military.

During this study there was no evidence of assessment of kindergarten student prior experience with ICT. Teachers indicated an implicit awareness of student prior ICT knowledge through making generalisations and broad assumptions, but did not actively seek out and record information to ascertain prior knowledge in any formal or even anecdotal sense. Although one teacher stated that she informally "*talked about those things that they had actually done on a computer before*", it was clear that this was not for the purpose of gathering information that could have been used for future teaching design. Information was generated serendipitously, and this apparent lack of purposeful data gathering leads to an important point about the relevance and connectivity of ICT experiences in the education for

these students as understandings about ICT use at school compared to home were separated out.

The finding highlights anomalies in the educational action of teachers - teachers articulate a belief in the value of technology to enhance learning, but do they actually know what that entails in their classroom realities; they articulate a belief in the importance of gathering instructional assessment information as children enter school but do they know how to genuinely respond to this data and create worthwhile responsive transition to school programs; they articulate the need for pedagogical practices to build onto students technological capacities, but do experiences in school reflect this and is a teacher's personal capacity with technology the influential factor which determines pedagogical action and decision making? Interestingly, the teachers agreed that the pictographic survey is useful tool to build into future school transition programs. The findings suggest teachers know the educationally 'right thing to do', but have more difficulty in designing practices which integrate technology into teaching design in meaningful ways.

School based practices

ICT use in many of the kindergarten lessons appeared tokenistic or overly basic and can be described as 'digital colouring-in'; for example, in Case One, ICT use comprised of watching and following along with a phonics DVD, looking at projected images reflecting the theme 'weather', using software programs for concept development (e.g.; counting programs). Importantly this seems to indicate that many practices in kindergarten demonstrate these mundane uses as 'legitimate practice' for younger students. The notion of a "hierarchy of legitimate use" describing ICT in terms of work activities and recreational activities (Downes, 2002, p. 25) needs to be explicitly investigated as it simply remains unclear the extent to which student's knowledge and skill is developed by school-based practices. Comments such as, *"I use the computer at home, but not at school"* need to be addressed seriously by schools. During one lesson the teacher discovered her students knew more than she had envisaged about ICT, but did not adjust the teaching path to reflect this new knowledge. What this demonstrates about the teaching and the learner is an important question to be addressed.

It was indicated by some of the teachers in the interviews that the higher primary grades took precedence over lower primary grades in many schools for access to computer use. This school-based practice demonstrates lower expectations of ICT utility in kindergarten classrooms and corresponds with other research findings (Dwyer, 2007) which found that early primary school ICT education has yet to achieve the same status as that of later primary school years. Furthermore, the pedagogy of ICT in many kindergarten classrooms appeared to be determined by the availability of appropriate, functioning resources, rather than by the subject or the teacher, limiting the selection of ICT experiences implemented with students in this study.

In some of the sites, teachers expressed concerns that it was 'difficult' to integrate technology into their lessons in meaningful ways because of lack of working computers and the fact that they only have a limited access to 'the lab' (they have to attend in their timetabled slot). It was indicated that it was often the case that it was the role of the 'release' teacher to conduct the ICT lesson. These school practices served to restrict the classroom practices the teachers in this study were able to develop; seamless integration of ICT across KLAs for authentic purposes was not possible in many of the circumstances. These site-effects on classroom practice cannot be underestimated if the aim for education is to be current and authentically connected to home-community technoliterate practices.

Changing school based practices: Prioritising ICT development from school entry

In Case Two teachers were supported in their learning to integrate ICT into teaching design using the *Framework for the Pedagogy of Multiliteracies* (Cope & Kalantzis, 2000) as a guide for the learning process. They participated in ongoing professional interactions and used collaborative on-line learning journals and practice tasks to support their learning; that is they were using their professional learning forums to 'practice' possibilities for classroom learning. The professional learning (learning about and practicing ICT) was designed around the teachers' own situation and within their own classroom and school context. These situated practices formed the foundation for learning and change. Using one example from Case Two, teachers learnt to use the program *Photostory 3* [as an example, teachers developed digital art portfolios of student work] to synchronously teach/learn aspects of literacy, the literacy of technology and the technology itself in a non hierarchical approach. As a group, the teachers were involved in explicitly learning about some basic technical aspects of ICT as well as developing familiarity with the metalanguage of technology, design and multiliteracies (Overt Instruction).

The following classroom transcript excerpt highlights key findings as teacher (applied professional learning) and students discuss mathematical concepts and textual design elements in the co-creation of a digital text within an interactive writing session.

Transcript excerpt 1:

- T: ... we need to find the photo which should be the first part of the story, okay now let's see, will it need to be moved forward or backwards to be in the first position? What do you think Michael?
- S1: it needs to go back
- T: everyone see that it has to move backwards, right, how many spaces? Let's counts together for this first one.
- Ss & T: One, Two, Three, right Three
- T: Okay, who will go next? Let's look//
- Ss: [calling out] Kayla, she was the first monster in the photos for our story...
- T: Now Kayla, your turn to move the next photo into the right place. Okay we have to put it in the right order so that it makes sense. Think about the direction the photo needs to move along... forwards or backwards?

Kayla: *Go forward one spot. I can move it with the mouse...*

[Later: teacher and students discussing font colour when adding written text over the photo images]

S1: *Let's use red for the writing; it's my favourite colour*

T: *Okay let's try it*

S2: *No we can't put red there coz you can't see it, the picture's at the back's too dark/*

S3: */Use yellow, it's bright*

S1: *I like blue, what about blue?/*

S3: */as long as it's light, if it's too dark you won't see it, click on that one*

S1: *What about this one [clicking on light blue]*

S2: *Yep that's good one, you can see it now*

This kindergarten teacher adjusted her more print focused literacy block to include interpreting and creating digital texts with her students, not in a way that diminished access and explicit teaching using traditional texts, but in a way that expanded the repertoire of textual practices students encountered in their lessons. This change broadened the understanding of text experienced in this classroom as the teacher modelled a multimodal writing process using the technology as a process and presentation tool.

Key findings:

- i) Synchronous Learning: literacy, the literacy of technology and technology

In the example [Transcript excerpt 1 above] the mathematical concepts of ordering, ordinal numbers and direction were taught simultaneously with story structure and learning the elements of design with technology used as a tool for presentation.

- ii) Technoliterate metalanguage

Lessons observed in Case One did not critically engage students with *technoliterate* discourse and subsequently did not lead to an exploration for the development of ICT schemas. In one example there was no consistency in the *technoliterate* language encountered by the students; different teachers of the same kindergarten class used different terminology for ICT concepts. For example one teacher referred to enlarging images as 'blowing-up', the other teacher named this concept as 'enlarging'. In contrast, the previous excerpt above [from Transcript excerpt 1, Case One] demonstrates how the metalanguage was explicitly drawn out in the instructional interactions in a more consistent manner. Interestingly in this situation the particular teacher was actually involved in PD, which focused on the development of the language and practices associated with ICT use in classrooms. In another instance, highlighted in the following excerpt (Transcript excerpt 2), one teacher within a co-teaching situation is embedding the specific language of technology within the lesson, naming the 'icons'; whilst the other teacher (later in the lesson) called these 'buttons'.

Transcript excerpt 2:

Teacher 1: *"Who can tell me what the little pictures on the left of the screen are?"*

S1: *"Places."*

Teacher 1: *"No, not places, starts with I."*

S 2: *"Icons."*

Teacher 1: *"Yes, icons and they let us get into programs. Now we need to do something to get into a program. Can anyone tell me what we have to do to get into a program?"*

S3: *"Two clicks."*

Teacher 1: *"That's right, we have to click on our right mouse button two times don't we? That's called double click."*

This suggests that a more overt knowledge of the techno-metalanguage for instruction is required by kindergarten teachers. In addition, it seems that a more consistent use of ICT metalanguage is necessary to significantly enhance student ICT content understandings and assist with student familiarity towards the discourse of ICT.

iii) Co-creation of multimodal texts in kindergarten

In Case One the teacher adjusted her practices in the daily literacy block to encompass a new dimension to the 'interactive writing' component by co-creating digital texts where possible [the *photo story*]. Additionally, in a daily collaborative journal writing [constructed on-line] students were using a new forum for daily practice of text construction; see the following excerpt from a kindergarten classroom collaborative journal (2008) as an example:

Journal Script 1:

Teacher: I learnt a lot today about making a story. What did you learn?

Nat: I lert how to load fotos on the computer to make a story. Our story was funny.

Dani: Today I lert about riting a book about numbers and monsters. I liked counting and finding me in the photos.

Charlie: today I Lert about how to make a book on the computer.

Alyce: I learnt to think about the colours I chose for my story, it had to be right or you couldn't see it properly.

Jono: I liked the funny faces we did for the book. We had to count to put them in the right spot.

Harry: it was good how we learnt to make the story in order

Merri: we did counting stuff and story making together our faces were funny

Collaboratively fashioning new types of texts in 'interactive or modelled writing' such as creating *photostories*, enable new creativities in the classroom which explicitly wire student for social practices which move in and between online textual spaces and reflect the kinds of technically complex and sophisticated texts students engage in the multimodal communication of today.

Transformative practical action

Case Two focused on how teachers worked individually, and collectively, to change their classroom practices. Observations of lessons and accounts from participants show how a discursive, responsive approach to professional development within situated contexts influences practice architectures in both the classroom and the school.

Technology as text

The technology revolution challenges teachers as text users to ask critical questions of the broad array of everyday texts they encounter both in school and at home. Case Two teacher participants, like most primary teachers, were all teachers of literacy with a deep knowledge of text structure and language features of a wide range of texts. A main part of the approach of utilising the framework for the pedagogy of *multiliteracies* used in this study as a structure for transformation was for teachers to identify what they know about text (both structure and linguistic features) and apply this prior knowledge of text when working with technology (the tools, software and the applications). By viewing technology as text to be interpreted and constructed, teachers through situated practice and overt instruction quickly shifted to a new level of understanding and application. One teacher even commented, *'what an easy way to look at it, it makes me feel less threatened.'* The introduction the concept of 'technology as text' developed as a practical and tangible way for teachers to understand the complexity of the technological tools and programs. Using familiar understandings of types of text enabled the teachers to build textual bridges from the known to the new.

Motivation for transformation

Teachers generally desire professional learning programs, which positively influence student learning and accomplishment, but in the domain of ICT they also need a multiplicity of practical and 'doable' examples of ways to accomplish various curriculum tasks with multimodal technologies (Hill & Mulhearn, 2007). This coupled with acknowledging students out-of-school digital literacy practices, set up the context necessary for teachers providing kindergarten students with ways to creatively re-represent curricular knowledge through multimodal design (New London Group, 1996). The following extracts are typical of how participants value the connection of situated learning to motivation for change.

... Both systemic policies and school leadership need to acknowledge that if the teachers have power and control [agency] over their own learning they will be more motivated to change; it is the right thing to do (Facilitator).....

Assisting teachers in local domains is a way to break down the power differential in learning in circumstances of *'deprivatisation and open-door practices which need to be seen as a mutual responsibility* [facilitator] and *'as a way to sustain motivation for change, it is a win-win'* [principal]. Collectively, teachers within one school setting demonstrated a desire to interrupt and transform literacy practices in progressive ways, and that is needed to be *'agreed upon by the whole staff and begin with kindergarten'* [principal].

There is robust agreement reflected in the following comment by one teacher which strongly suggests that success requires a mutual connectivity between student and teacher learning and a strong belief that what they are doing matters. Additionally, the comments suggest that education is a shared professional endeavour, one where solidarity in the profession is based

on a relationship, which visibly strengthens unity in the field. What is highlighted is that relational architectures (Edwards-Groves, Kemmis, Hardy & Ponte, forthcoming; Pariser, 2000) through *enabling* leadership practices are a resource for extending a teacher's scope of action:

I trust [the principal] to come into my room when I have a problem and need to learn to do something or if I forget like using the [ICT], he is happy to come and show me, and doesn't make judgments; he really is there to help me. I think it is important because he really believes that using this technology will make a difference to kid's learning. He is willing to let us take time to try things out, it doesn't just come on us so we feel even more pressure and I think it is all interrelated...it's like we are a team working on this together and that helps to keep the momentum going.... (Classroom Teacher)

Central to this idea is the notion of in-situ capacity building through collaborative and creative professional learning. The findings of this study show that the 'Framework for the Pedagogy of Multiliteracies' (Cope & Kalantzis, 2000) enabled teachers to use their own circumstance as a platform for change. The opportunity enabled teachers to evaluate and rationalise practical action; to gather knowledge with and from others; to share and extend new knowledge and experience with others; and to transform existing understandings and practices in a supportive process of professional development.

Concluding thoughts

For many classrooms, the teacher's personal familiarity, capacity and facility with technology determines to what extent it is given pedagogical space within the practice architectures (design, interactions and implementation) of their classrooms. Students are consequently bound, and possibly restricted, by their teacher's personal sense of competence with the use of Information Communication Technologies (ICTs). And in a climate of increasingly rapid change and more demanding policy expectations to embed ICT across Key Learning Areas (KLAs), classroom teachers are faced with developing new capacities for utilising a vast range of technologies in their teaching, which for many is a challenging and confronting prospect. This has meant that there is a need to transform both the substance and pedagogy of the classroom experience as these new technologies contend with new social practices and political agendas, which sharply impact on schools and classrooms across the country. This leaves many teachers feeling pressured and insecure in the face of new trends, change, accountability and 'new pedagogical imperatives' (Cuttance, 2001).

It has long been recognised that one-off professional development workshops will do little to support the transformative practices required to cultivate learning environments which will sufficiently take students into their new expansive, flexible and multiliterate futures.

Developing *technoliterate* practices focusing on building both a textual [and indeed technological bridge] is as necessary for teachers as it is for the students who come to school. Teachers require a different kind of support to develop the knowledge needed to integrate ICT, which develops personal professional capacities and permeates classroom

practice in a way that learning is the centre point and the technology 'invisible'. To this point, both the policy-making bodies and schools themselves need to be innovative and visionary, encompassing a genuine commitment to the transformation of schooling ideals (O'Hara, 2004). Developing such a praxis orientation (Edwards-Groves, 2008) could see ICT as the tool and the forum necessary to drive whole school reform and organisational change that is ubiquitous within the educational environment.

This paper suggests that working cooperatively and collaboratively with colleagues, teachers are able to adjust practice architectures in a way which recruits, rather than ignores or erases, the different *subjectivities* – discourses, interests, intentions, commitments and purposes – that students bring to the learning table (The New London Group, 1996). Providing quality professional learning opportunities for developing, appreciating and applying new creativities enables classroom learning to enter the new landscape for teaching and learning. What is suggested in this paper is that many PD opportunities offered to teachers treat technology as a topic, and although they are provided with inspiring success stories, ideal models and interesting examples of potential uses of technology integration in classrooms settings, there appears to be disconnect between the models and examples and the in-reality power teachers feel to trial, practice and extend capacity when they step back into their classrooms. Importantly, teachers need time and support to practice, what for many is a new technical skill. Furthermore teachers require dedicated communicative learning spaces with colleagues to rethink more traditional pedagogical action. What is needed is an approach whereby technology is treated as text (as a known concept). This seems to be a supportive way for the less confident teacher to bridge the situated practices and 'everyday' realities of classrooms to newly transformed actions and interactions.

It is further argued that gathering more precise information about home *technoliterate* practices of young children needs to be placed firmly on the school's transition-to-school agendas. If schools are committed to designing learning experiences which genuinely respond to knowledge of student's needs and capacities, then just as they gather and record data about children's prior-to-school social, literacy and numeracy capacities, they need to gather more precise information about home ICT experience and competence. Definitive data should be recognised, utilised and extended upon in teaching design to create holistic and authentic learning opportunities encapsulating both student in-school and out-of-school ICT learning. It could be that the implications of this will afford students opportunities to engage with the intellectual and creative application of digital technology that is required to develop an innovative ICT culture in today's classrooms, rather than digital colouring-in as many kindergarten student experience.

References

- Ainley, J., & Enger, L. (2007). *Student use of, and engagement with, information technology*. Melbourne: ACER.
- Amante, L. (2007). The ICT at elementary school and kindergarten: Reasons and factors for their integration [Electronic Version]. *Educational Sciences Journal*, 3, 49-62.
- Anstey, M., & Bull, G. (2006a). *Teaching and learning multiliteracies: Changing times changing literacies*. Kensington Gardens, South Australia: Australian Literacy Educators Association.
- Australian Bureau of Statistics. (2006). *Household use of information technology – Australia 2005-06*. Canberra.
- Conole, G., De Laat, M., Dillon, T., & Darby, J. (2006). An in-depth case study of students' experiences of e-learning: How is learning changing? In *Proceedings from the 23rd annual conference of the Australasian Society for Computers in Learning in Tertiary Education*. Sydney, December.
- Cope, B., & Kalantzis, M. (Eds.) (2000). *Multiliteracies: Literacy learning and the design of social futures*. Melbourne: Macmillan.
- Creswell, J.W. (2008). *Educational research: Planning, conducting and evaluating quantitative and qualitative research* (3rd ed.). New Jersey: Pearson Education Inc.
- Cuttance, P. (2001). *Information and communication technologies in School Innovation: Pathway to the knowledge society*. Canberra: Department of Education, Training and Youth Affairs.
- Department of Education, Science and Training. (2002). *Raising the standards: A proposal for the development of an ICT competency framework for teachers*. Canberra: Department of Education, Science and Training.
- Department of Education, Training and Youth Affairs. (2001). *Information and Communication Technology for Teaching and Learning*. Canberra: Department of Education, Training and Youth Affairs.
- Downes, T. (2002). Blending play, practice and performance: children's use of the computer at home [Electronic Version]. *Journal of Educational Enquiry*, 3(2), 21-34.
- Dwyer, J. (2007). Computer-based learning in a primary school: Differences between early and later years of primary schooling [Electronic Version]. *Asia-Pacific Journal of Teacher Education*, 35(1), 89-103
- Edwards-Groves, C. (2008). The praxis-oriented self: Continuing (self-) education. In S. Kemmis & T.J. Smith (Eds.), *Enabling praxis: Challenges for education* (pp. 127-148). Rotterdam: Sense.
- Edwards-Groves, Kemmis, Hardy & Ponte, (forthcoming). Relational architectures: Recovering agency and solidarity as living practices in education. *The Pedagogy Culture and Society Journal*.
- Freebody, P., & Hornibrook, M. (2005). The relationship of reading ICT to opportunity structure: An object of study? [Electronic Version]. *Reading Research Quarterly*, 40(3), 371-376.

- Goldman, J.D.G., & Hocking, C.G. (1999). Internet educational usage by high school students around the world [Electronic Version]. *Educational Practice and Theory*, 21(1), 67-85.
- Haughland, S.W. (2000). *Computers and young children*. Champaign, Illinois: ERIC Clearinghouse on Elementary and Early Childhood Education.
- Hill, S., & Mulhearn, G. (2007). Children of the new millennium: Research and professional learning into practice [Electronic Version]. *Journal of Australian Research in Early Childhood Education*, 14(1), 57-67.
- Kemmis, S. & Grootenboer, P. (2008) Situating praxis in practice: Practice architectures and the cultural, social and material conditions for practice. In S. Kemmis & T.J. Smith (Eds.), *Enabling Praxis: Challenges for education* (pp. 37-62). Rotterdam: Sense.
- Johnson, D., & Kress, G. (2003). Globalisation, Literacy and Society: redesigning pedagogy and assessment [Electronic Version]. *Assessment in Education*, 10(1), 5-14.
- Langley, M. (2009). *iKindy: An exploration of the integration of information and communication technology (ICT) into kindergarten classrooms*. Unpublished Honours Thesis, Charles Sturt University, Wagga Wagga, New South Wales.
- Li, H. (2006). Integrating information and communication technologies into the early childhood curriculum: Chinese principals' views of the challenges and opportunities [Electronic Version]. *Early Education and Development*, 17(3), 467-487.
- Ministerial Council on Education, Employment, Training and Youth Affairs. (2000). *Monitoring progress towards the National Goals for Schooling: Information and communication technology (ICT) skills and knowledge*. Canberra: National Education Performance Monitoring Taskforce (NEPMT).
- Ministerial Council on Education, Employment, Training and Youth Affairs. (2005). *Building a knowledge culture: An education and training action plan for the information economy 2005-2007*. Canberra: Curriculum Corporation
- National Office for the Information Economy. (1998). *A strategic framework for the information economy*. Canberra: Department of Communications, Information Technology and the Arts.
- New South Wales Board of Studies Syllabus and Support Documents (1993, 1998a, 1998b, 1998c, 1999 2002). Sydney: New South Wales Board of Studies.
- New South Wales Department of Education and Training. (2006). *Our young learners: giving them the best possible start*. Sydney: New South Wales Department of Education and Training.
- New South Wales Department of Education and Training. (2007). *Expected learning outcomes: List of computer skills*. Sydney: New South Wales Department of Education and Training
- New South Wales Teachers Federation. (2000). *Information and communications technology in education*. Sydney: New South Wales Teachers Federation.
- O'Hara, M. (2004). *ICT in the early years*. London: Continuum.

- Organisation for Economic Cooperation and Development. (1996). *The knowledge based economy*. Paris: Organisation for Economic Cooperation and Development.
- Pariser, E. (2000). The community school: Developing the approach of "relational education". *A Coalition for Self-learning: Creating Learning Communities*.
- Pluss, M. (2007). ICT in the classroom [Electronic Version]. *Teacher*, 177, 56-58.
- The New London Group. (1996). pedagogy of multiliteracies: Designing social futures [Electronic Version]. *Harvard Educational Review*, 60(1), 60-92.
- Turbill, J. (2001). Getting kindergarteners started with technology: The story of one school [Electronic Version]. *Reading Online*, 5(1).
- Van Scoter, J., Ellis, D., & Railsback, J. (2001). *Technology in early childhood education: Finding the balance*. Portland Oregon: Northwest Regional Education Laboratory.
- Warner, D. (2006). *Schooling for the knowledge era*. Camberwell, Victoria: Acer Press.
- Wenger, E. (1998). *Communities of practice: Learning, meaning and identity*. New York, NY: Cambridge University Press.
- Yost, N. (2003). Look what kindergarten children can do with technologies! In *Proceedings from the IFIP Working Group 3.5 Conference: Young Children and Learning Technologies*. Parramatta, New South Wales, July.
- Zammit, K., & Downes, T. (2002). New learning environments and the multiliterate individual: A framework for educators [Electronic Version]. *Australian Journal of Language and Literacy*, 25(2), 24-36.
- Zevenbergen, R. (2007). Digital natives come to preschool: Implications for early childhood practice [Electronic Version]. *Contemporary Issues in Early Childhood*, 8(1), 18-28.
- Zevenbergen, R., & Logan, H. (2008). Computer use by preschool children: Rethinking practice as digital natives come to preschool [Electronic Version]. *Early Childhood Australia*, 33(1), 37-44.