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Title: Mobile Learning thinking: Get on your skateboard to keep up!

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Abstract

“Consider my world please. I’ve been born in the last decade and everyone in our family has a mobile phone. We play games at home on the computer and I teach my parents how to use the Internet. Mum loves me helping and Dad and I have heaps of fun. My teacher Mrs Cool is great – she lets me help the other kids in our class and sometimes I get to do awesome things for school. ...Having my own computer at school would be better”. The messages in this student’s observations are many and complex. While personal computers may be the case for some privileged school contexts and equipping all teachers is the trend for public education in Australia this investment may be too little too late. The business world is leading the technological change towards online mobile devices and young people themselves are demanding more personalised access. Reflecting their socio-cultural need to be connected, there are urgent messages for educators to face for motivation and learning outcomes commensurate with curriculum reforms. Computer laboratories are being challenged by the need to tool young people with handheld computers. This paper takes up some of these issues with reference to ongoing ARC funded research projects.

Keywords

New Pedagogies, digital mobile technologies, learn-space, professional learning

Background

A major dilemma facing educational debate in the current era is centred on our ability as educators to reconceptualise teaching and learning spaces. From the reflective phase of the 1990s when observers turned to philosophers and critical theorists like Foucault (1970; 1997), Bourdieu (1993) and Lefebvre (1991) for guidance, educational thinking has moved on towards a critical need to find practical solutions for educational processes. The emerging power-space relationships that exist in the digital age of information and communication technologies require radical new thinking to avoid reactive responses in our schools that do little to build bright innovative and challenging futures for young people. To put this issue in more blatant terms where educational institutions and schools remain bounded by the same traditional thinking regarding their physical and structural appearance it seems pertinent to suggest that we are likely to see a continuation of the current ‘behavioural problems’ reflected in truancy, verbal and physical abuse, poor attitudes and low performance. At the time of writing these are major electoral issues in the United Kingdom where the new Blair Labour government has advocated more powers

for schools to implement strategies that will stimulate greater social responsibility for schooling including respect from pupils and parental responsibility for teaching their children 'respect'. It seems ironic that this seemingly conservative platform is coming from a Labour government. However, looking to Scandinavian countries where radical social reform is widely recognised we can see evidence of even more draconian measures to ensure community responsibility for children's behaviour. In Sweden, for example, parents lose benefits and can be fined through the tax system for failing in their duties to teach their children about their community responsibilities and social respect.

There seem to be in these actions two major issues. The first is the immediate need to reinvigorate the traditional idea of schooling and bring children back into the community of learners. Perhaps this does require broader societal debate about roles and responsibilities of parents as well as schools. In the Australian context liberal thinking and acceptance of difference have been fundamental to states' curriculum development for the last decade. Hence, to suggest restrictions and/or enforce compulsory schooling and responsible parenting would seem somewhat antithetical or too far in the future for a reasoned discussion. The other major issue relates to the content and delivery of curriculum (Robertson, 2004). This paper takes the view that the longer term interests of western style education depend on how we perceive the curriculum. The one reality that educational institutions perhaps do not wish to face is that 'behavioural' problems may be compounded by 'boring', inappropriate curriculum which ignores young people's realities and immediate needs. If this is so then our educational approaches are failing to acknowledge the most basic rule of 'expert' teaching and that is to stimulate learning by first making connections with the student's personal world. For we teachers who were educated in a former era there is the constant need to remind ourselves of the need to identify learners' 'worldviews' first then, second, in Vygotskian terms, scaffold the connections to new ideas and information.

The question is how do we engage the imagination of young people, and make learning exciting and sufficiently stimulating to maintain their attention, develop their cognitive processes and meet societal needs for literate, numerate, healthy and socially responsible citizens. Preparing the next generation of adults requires constant vigilance to accommodate change. Static states have given way to fluid ever changing and dynamic contexts where educational agency and structure are under continual public scrutiny. The stakes are high if the educational providers get it wrong. For instance, the commercial workplace risks failure if efficiencies in production and outputs do not match the markets' needs. At the same time the rapidity of change for schools means its practitioners face uphill battles to gear their practices to longer term societal needs (Chapuis 2000; Dellit, 1998; King, 2002; Windschitl and Sahl, 2002). Nevertheless, the challenge needs to be met. As Yelland (2001, npa) notes: "The problem is that we are attempting to mould new technologies [in schools] into old paradigms – and there is a mismatch".

Taking this challenge seriously requires analysis of our own subjectivities to see how well our thinking can take on the challenges of the next generation. The world of young people today is global, connected and fast! (Robertson, 2002). Personalised, digital and mobile are terms synonymous with youth culture. Email, bulletin boards, chat rooms, networked games, MUDs (Multiple User Domains), MOOs (Multiple Object-Oriented environments) and weblogs all form part of the expanding virtual world of learning opportunities. For those of us who grew up in the days of crystal sets and radio broadcasts from distant locations often interrupted by the static of land and water linked connections

the wonders of satellite and wireless connections beaming communications around the world provides the novelty of our times. For young people of the twenty-first century synchronous links with people any where and any place is reality. This is the next generation and perhaps lamentably their worlds seem better represented in the world of business and commerce than in our current educational environments. Table 1 provides a summary of the kinds of thinking our research with young people has identified as 'typical' (Robertson and Fluck, 2004a; 2004b, Robertson *et al.*, 2006). Findings described relate to an Australian Research Council Linkage 2002-2004 grant (See ARC Linkage LP0210823 findings at <http://www.educ.utas.edu.au/users/ilwebb/Research/>)

Table 1: Comparison of 'next' and 'old' generation thinking (Robertson & Fluck, 2004a)

Next generational thinking (Constructivist)	Old generational thinking (Delineated)
• Not all doing it the same way-Process-fast, games	• All doing it the same way - Learning by prescription
• Not all doing it in the same place	• All doing it in the same place - Process – linear, rules
• Not all doing it at the same time	• Seeking order (systems)
• Not all using the same tools: eg mobile learning	• Same tools for all - Print and auditory focus
• Knowledge sharing	• Knowledge acquisition
• Problem solving - Teacher as participant learner	• Problem avoidance - Teacher transfer
• Risk-taking - Spontaneous	• Risk avoidance – Planned activities
• Collaborative - Learning by negotiation	• Individual and competitive
• School is constructed and abstract	• School is a material place
• Learner as assessor	• Teacher as assessor

In this exploratory paper an attempt is made to link these observations and comments in three sections. The first section provides a literature review of research findings that support the assumptions set out in this introduction. The review highlights the rapid shifts in research over the past five years with e-learning moving further towards the mobile learning construct. The second section includes excerpts from current research projects with which I and my colleagues are involved. While much of this research has been classroom based and therefore not specific to mobile learning there are instructive messages for curriculum designers. The third section puts forward a tentative model or 'learn-space' (Peters, 1999) which my colleagues and I are using to reconceptualise school as an abstract or personally constructed space as opposed to the traditional view of school as a material space with fixed buildings and classrooms. The Learn-Space construct aligns with our research view that learning outcomes are likely to be enhanced when students have access to the learning environment any place and any where.

Literature review

Arguably, personal connectivity through mobile digital devices is the most significant development in current ICT related research. Some authors maintain they help to shape young people's thinking (Aleven and Stahl, 2003; Hargreaves, 2003). In an e-learning society users of mobile devices are 'untethered' (Anderson and Blackwood, 2004). They have no need to occupy the same physical space. Recent psychological research shows the negative social effects on adolescents who do not own mobile phones (Mathews, 2004)! These devices are part of their emerging identities and subjectivities (Ivarsson, 2003). As 'active constructors' of new knowledge, intelligence is distributed and epistemologies individual (InterActive Research Project¹). Yet we still mostly teach in fixed, closed spaces.

¹ See http://www.interactiveeducation.ac.uk/teach_learn.htm

Despite the heavy investment in ICTs (Information and Communication Technologies) for schools over the past two or more decades by governments around the world the lowering cost of wireless technologies is renewing the pressure to invest more directly in digital literacy (DEST, 2000; OECD, 2001). Rethinking the efficacy of the computer laboratory is part of this review process of how best to invest for the future (Chapius, 2000; Oldknow, 2001). The evidence to do so is compelling. An expanding research literature links motivation with wireless technologies (Becta, 2003; Vahey and Crawford, 2002). There is also OECD evidence of links between ICT and higher order thinking skills that are likely to contribute to the social capital of society and lead to better economic potential (Kearns, 2002). Hence, issues in school flow over to social and economic competence or preparation for life-long learning. As Bottino (2004) states we need to rethink the ways we teach. Authentic pedagogic responses take notice of what learners want (Capper, 2001; King, 2002). As indicated in Table 1, they take a constructivist approach that works in partnership with the learners (Lake *et al.*, 2004; Rosas, 2003; Savill-Smith and Kent, 2003).

In the OECD world policy documents reflect future directions for education (Candy, 2004). Working towards a better connected society is a common theme and ICT literacy is one of the indicators (Trewin, 2002). The ongoing investment reflects optimism concerning the potential of ICTs to enhance students' learning outcomes and achievement potential (Kearns, 2002). Issues in schools are viewed as flowing over to social and economic competence or preparation for life-long learning. Learning for the knowledge society has lifelong challenges for all aspects of daily living (Joinson, 2003). Educationally this recognition is challenging educational researchers to reconsider the role of home as a place of learning. The response has sparked new interest in ways of integrating learning outside school with school based activities (Kent and Facer, 2004; Yelland, 2001). Holistic approaches are recommended. One conclusion might be that young people's psychological and physical wellness and success requires redesigning curriculum to take into account their lifeworlds².

In brief, in the e-learning society the research points the way for how we can best contribute to the intellectual and social well-being of our future citizens. This requires working collaboratively with learners and being willing to listen and learn from their experiences of new technologies. Sharing and learning from one another seems to be the underlying principle for achieving educational success within the new learning environments. The literature expresses this as building communities of practice in the workplace (Webb *et al.*, 2004, Wenger, 1998).

Selected research – a study of cooperation and trust

One of the major themes in the literature extant, and underlying any notion of community is cooperation between learners and their teachers, parents and friends. The whole new world of mobile learning assumes flexibility for participants to be 'free' to initiate communication anytime and anyplace without necessarily having the expectation of an immediate response. This is the quiet other world that can run simultaneously with other daily activities. In the following paragraphs selected examples from ongoing research are used to highlight the importance of this social dimension in the educational success

² See <http://www.iteawww.org/>

equation. The examples given are from the ARC research cited earlier in this paper as well as two smaller research projects funded by internal University of Tasmania research grants. Most of the research has been conducted within primary classrooms in Tasmania and Victoria. More recent studies have included fifteen year olds. All projects have the common goal of developing new knowledge related to the changing pedagogies of the digital world. Our more recent emphasis has been on online learning objects (bounded online teaching and learning experiences) and access through handheld computers and/or ready access at home and school to Internet linked computers (see Robertson and Fluck, 2004a, 2004b, 2004c). Hence, rather than detail these research projects again for this paper an extrapolation of relevant illustrative instances is taken from our combined research effort.

These exemplars of cooperation can be loosely grouped as:

- 'Expert' versus 'novice' teacher
- Peer to peer sharing and mobile learning opportunities
- Teachers and teaching peers: models for professional development

'Expert' versus 'novice' teacher

Much has been written in the research literature about what makes an 'expert' teacher (Robertson *et al.*, 2001). However, our research would suggest that this literature needs revisiting to accommodate the new classroom dynamics. The 'hum' of the classroom has often been used to describe that intangible quality of a working, on-task classroom community. There is a lack of tension as both teachers and students go about their daily tasks of learning. Three examples are used to illustrate these distinctions. They have been selected from fifty classroom studies that were part of the ARC Linkage 2003-04 study. In all three classrooms the equipment included at least two Internet connected computers. The children were all in Grade 5 of aged 10-11 years.

Classroom 1 – 'novice' teacher

In this classroom the teacher was in his second year of teaching. The twenty-four children were mostly seated in groups of six. During one two-hour observation period observers noted the teacher requesting students to complete their maths 'worksheets'. Once completed and if available they were permitted to use the computers for open tasks. The teacher during this period focused his attention on two 'struggling' students. He seemingly had little awareness of the actual classroom activities, appearing to make the assumption that because the noise level was low there was 'on-task' learning taking place. The latter could not be further from the truth. At two tables groups of boys were noted to be 'hiding' their conversations behind their worksheets and in fact doing very little relevant work. At one computer, two boys were playing computer games and at the other computer two girls were intently interested in the 'Home and Away' website. When asked at the conclusion of the teaching period his reactions to the events that had taken place he commented that he thought most students were on task and that this year 'I am concentrating on maths. Next year I plan to concentrate on literacy'!

While we could be very critical of this beginning teacher, and with considerable justification, very concerned for the long term education welfare of the students in the class, the experience does serve to highlight the complexity of the classroom dynamics. Pertinent questions relate to the degree of school based mentoring or coaching available. That is, among other things, how effective is the community of practice in the school for supporting and monitoring the effectiveness of beginning teachers.

Classroom 1 – the ‘expert’ teacher?

This example offers a very different slant on classroom dynamics. The teacher of this large class of 32 students was very experienced and considered to be the IT guru for the school³. There was plenty of evidence to suggest high level proficiency with both the use of and application of IT to the curriculum. The classroom had a small corner dedicated to computers. Six computers were Internet linked.

The confidence of the teacher was quickly apparent. Multiple tasks were occurring and all students appeared actively engaged in learning. There was an obvious mutual respect between the teacher and her students. This classroom did appear to have that elusive ‘hum’ of quality learning experiences taking place. Observers were encouraged to talk with the students who, when approached, proudly displayed their various ‘products’.

Conversations with the students working at the computers left observers wondering about the quality or nature of the learning actually taking place. Students proudly shared their personal web pages which were stored in their online class site similar to Web-CT or Blackboard content management systems. Although password protected and with exclusive access for the student and teacher the content management system used at the time enabled students to interact with other classes located in other countries. The students were obviously excited by this communication opportunity. They enjoyed being able to ‘post’ their homework after hours (in this school community there is close to 100 home Internet access). The teacher also made a point of noting the value of this system for accessing students’ work for assessment from home.

Plenty of opportunity existed in these arrangements for nurturing the kinds of cooperation and social interaction that underpin a viable community of learners. However, and this is being rather parsimonious, there did not appear to be much evidence of higher order thinking in the exemplars of work shared by the students. The computers seemed to provide a filing system for learning rather than a learning tool for expanding understandings.

Classroom 3 – the ‘expert’ teacher

This final example came as a chance cameo of ‘excellence’. Along a long corridor of a large metropolitan primary school with in excess of 600 students a teacher and her class were to provide our observers with wonderful examples of learning, cooperation and community. Like an oasis in the desert, this classroom of engaged learners and teacher was surrounded by the traditional classrooms with their lines of students facing the teacher as they might have in the 1950s. There were 24 children in this class. Along with their teacher they shared a large space with many learning experiences operating simultaneously. One of the students was wheelchair bound and required special assistance and space to gain computer access which all students appeared to willingly offer. This teacher was barely observable and could not have had an ‘eye’ over the large space at any given moment. Yet, there was ample evidence to support the conclusion that here was a classroom where students were all engaged in tasks that extended their thinking through problem solving and discussion. While multiple tasks were occurring the teacher was able to assist individual students. At the same time and despite the large space it was obvious

³ This school was one of the original Apple computer schools to benefit from early IT adoption. The school has been IT linked for more than 25 years.

that she had a good grasp on all students' activities. Her gentle style of encouraging individual students to assist others who were struggling was a feature of her teaching strategies. Hence particular skills of individual students were being recognized and valued as part of the sense of classroom community learning.

The computers in this set of learning scenarios were one tool to assist the decision making processes. A particular task observed is a good example of the higher order thinking that was being encouraged. The theme was a study of the life and work of the artist Van Gogh. There were books and displays of related material in the classroom as well as a set of learning experiences that focused on literacy and literary terms. At the computers several students were linked to an online web site which included a series of Van Gogh letters. They were reading the letters online and required to note, among a list of things, examples of metaphor and simile. The tasks were demanding in the sense that students needed to understand what a metaphor or simile is and then decide from the letters if the sentences were suitable illustrations. Dictionaries were being used for unfamiliar words. They were drawn to the letters with initial curiosity but required to apply analytical thinking to the text. Working in pairs and small groups of three the students appeared to enjoy the challenge and learning. Asked afterwards about the task we were curious to know how much scrutiny was required to check that the letters were acceptable for young readers. The teacher reported that reading and monitoring of potential Internet sites takes a long time for preparation but enjoyable for her as well as the students when the right choices are made.

Of the three examples offered this last appears to offer the best model of class based computer use. There was trust and respect between teacher and students and between students Aimed at critical thinking and enquiry this teacher in her understated manner came closest to offering learning opportunities related to next generational thinking.

Peer to peer sharing

While the above case studies made reference to the opportunities made for peer tutoring and access to ICT for specific tasks there was little evidence of mobile learning as we now understand. Two examples of mobile online peer tutoring are offered as illustration of the possible potential for motivation of students.

Example 1: Online learning objects

A study conducted in 2003 linked 11 year-old and 15 year-olds located in Victorian and Tasmanian schools to an online learning site for access to a science unit based on online learning objects. Students located in their respective schools were encouraged to access the site after school hours and engage in chat room discussions with students in other schools. While in the Tasmanian schools all families had Internet linked computers (some provided by the project) all students reported access to the web site outside their classrooms either at home, friends place or in locations such as the school library. Hence, equity of access was not viewed as a detractor for the study.

The following quotation taken from the web logs and reported in an earlier paper on this study highlights both the fluidity of the conversation between the students in the online chat room and the ease with which they slip in an out of text language and personal comment (Robertson and Fluck, 2004c). At the same time the students appears to be 'on task'. The chat conversation is taken from two year 5 boys (11 year olds).

“James>>hi

Billy>>how r ya
 James >>hi
 Billy >>hurry up
 James >>good thanks
 Billy >>hurry up
 James >>your stuped
 Billy T>>dont swear ill tell mrs x...!!!!
 Billy >>arent we supposed 2 be talkin about webct
 James >>no
 Billy >>u sure!!
 James >>no
 Billy >>then we r supposed 2 be talkin about it
 James >>no
 Billy >>wich one did u like
 James >>the one with the gobelizers
 Billy >>i made my dude really fat!!!!!!
 James >>ok
 Billy >>k
 James >>i like the gobilizer one the best
 Billy >>2
 James >>m t
 Billy >>wat the hell does tat mean?????????
 James >>dont now
 Billy >>ur strange!
 James >>y2
 Billy >>wat does dat meaan???????'
 James >>dont now
 Billy >>i was hopin dat some punchbowl people were on!
 Billy >>cya again soon
 James >>bye
 Billy >>bye” (p. 272).

There is comfortableness in the conversation of the boys. Perhaps as reported the time, the learning objects had a ‘novelty’ learning effect. The online learning site offered legitimate privacy for sharing with friends thus allaying parental concern for the content of their viewing targets. Nevertheless, their messages in this conversation and others recorded are clear. They liked the freedom of access anywhere, anytime. As reported through their teachers and interviews they liked the learning objects that resembled games, had bright colours and where possible interacting and manipulating the material. They did not like too much text and this proved to provide a complication for one class where the children were predominantly of Vietnamese refugee backgrounds and struggling with the language. Hence considerable teacher scaffolding was required.

Example 2: Handhelds and Mathematics

The other example relates to a recent piece of research involving a comparative analysis of teaching the same unit of work with Year 9 (fifteen-year-old) mathematics classes. In this study the aim was to compare the learning outcomes when teaching a unit on graphicacy using three different approaches. All teachers involved were very experienced practitioners and involved in the planning and reporting of information.

One class was denied all computer access, another used graphical calculators and the third used the computer laboratory in the school and handhelds for teaching the unit. Setting aside the levels of success of the first two teachers the latter provides the example of quite remarkable behavioural change one the handhelds were introduced. Classroom observations of this class highlight the exceptional skill of the teacher to gain the focus

and attention of the students. Many of his class appeared initially less excited with mathematics commenting on entering the room ‘maths sux’ and repeating the observation even having successfully completed required problem solving. The success factor seemed linked to the obvious respect and liking for the teacher in their ‘playful’ interplay. This teacher knew every movement of the students and kept them focused.

The event that left the teacher confounded was the introduction of the handheld computers with their wireless capacity for beaming results from one to another and to computers in the laboratory. Clearly, and to the teacher’s utter surprise, the students were delighted with this tool and quickly became fully engaged in the tasks presented via the handhelds. Their aptitude as much as their motivation were the biggest surprise for the teacher who now pending retirement has declared his commitment to taking on this new challenge as a means to reinvigorate interest in mathematics for the less than motivated secondary school ‘problem’ students.

In these examples, the opportunities made available for students provided both their highly competent teachers and our group of researchers with fresh insights into the powers of providing students with e-learning opportunities. Freeing up the space and time for learners gives them the impetus to do what they seem to like doing most with the new technologies. The voices of the students reveal their likes and dislikes but also emphasise the characteristics of challenging e-learning and teaching spaces. This is no argument for relaxed methods in schools but a challenge to rethink the ways in which we offer the curriculum.

Teachers and their peers: towards a model for professional development

From studies in more than fifty schools during the 2002-2004 we have been able to develop the view that the most effective use of ICTs in schools occurs where the following conditions are present (Webb *et al.*, 2004):

- There is a stable long serving core staff – including the principal.
- The principal is an ICT enthusiast and genuinely interested in being a learner as well as a leader of change.
- The IT infrastructure is reliable, well supported and technical help is readily available.
- The school works at being a community of practice and genuinely supports the learning of one another.

Where these conditions exist there appears to be an alignment of the purposes, process and products or outcomes within the daily operations of the school. The hierarchical nature of the staffing structure seems to be submerged by the purposeful activity of a dedicated group of professionals supporting one another, listening to the needs of their colleagues and students and sharing their knowledge through formal strategies as well as informal discussion. The principal plays a pivotal role in making these conditions happen. To illustrate, the following school described provides an example of best practice or a learning environment where all these conditions are met. The impression gained, and reinforced through a number of visits over a three year period, is that of a whole school and school community approach – a context built up over a period of years.

The school described is a government primary school located within a professional middle class metropolitan suburb of the state of Victoria (N~300). The Principal has been in his current position for more than a decade. With his apparent and acknowledged

'healthy' cynicism toward the promotional ladder of his profession he sets targets for success and seeks rewards through the dynamic changes that are part of a long term vision for the school community. His success as a leader is in the achievements that are obvious when taking a stroll around the school. According to all educational indicators this is a school where the learners are achieving well on leagues tables for performance indicators such as literacy and numeracy. A clear part of the vision for this success is in the effective integration of ICTs into the school curriculum.

In our meetings with the Principal and teachers we were aware of the whole school approach to decision making. Teamwork is at the centre of the school's capacity building for its community of learners and celebration of success is part of that process. As well as maintaining his personal ICT skills the Principal has made a deliberate commitment to infrastructure funding to achieve the desired ICT goals. At the same time the teachers at the school have been encouraged to take personal responsibility for their knowledge and skill acquisition for specific IT software and in so doing assuming the status of 'expert' for their colleagues and students in the school.

One strategy observed in one of several computer laboratories or computer hubs in this school related to developing skills for using 'FrontPage' software. Arguably, not the simplest of software for beginners, one teacher in the school is the 'expert' and students are cycled through the laboratory for expert training with this teacher then 'handed back' to their usual classroom teacher for follow-up application. The buzz of related discussion around the lunch table in the staffroom suggested the power of this strategy for community building within the school both for teachers and for peer tutoring within the class or students.

On our last visit to the school we left the Principal overseeing the next building project. His close eye to the detail in the planning was clearly part of his vision to maintain the highest standards of facilities and ensure the best possible ongoing environment for children's learning. In this school there were repeated examples of teaching and learning excellence taking place. This was, and presumably remains, a school that 'hums'. The integration of ICTs into the daily practice of teaching and learning appears seamless and comfortable. This school is also eager to extend to the next stage of ICT integration that incorporates active online learning in digital learning 'spaces' (Peters, 1999). A brief description of this new direction for schooling follows.

Towards an authentic online learning model

Assuming personal digital computers are to be part of the future of schooling then there is urgent need to be thinking about the pedagogical needs and plan for them. As indicated in the beginning of this paper the business world and the personal worlds of our students and their families are fast slipping ahead of the kinds of practices that are common in schools. The emerging research supports the need to plan for digital mobile learning and this will require some fundamental leaps in the thinking of practitioners, administrators and educational agencies. To their credit the innovative practitioners are supporting the need for re-envisioning both the curriculum and its delivery with mobile learning gaining enthusiastic support from the creative thinkers prepared to take the necessary risks to lead the changes. Hence to complete this paper I have included a diagrammatic representation of a digital 'learn-space' concept that is part of the current research which a group of

colleagues and I are conducting in two Australian states⁴. Our aim is to use a range of online tools all within a bounded and password protected learning space where students located in different schools have access for completion of common units of work which might include exemplars of online learning objects as well as negotiated enquiry based problems (see Figure 1).

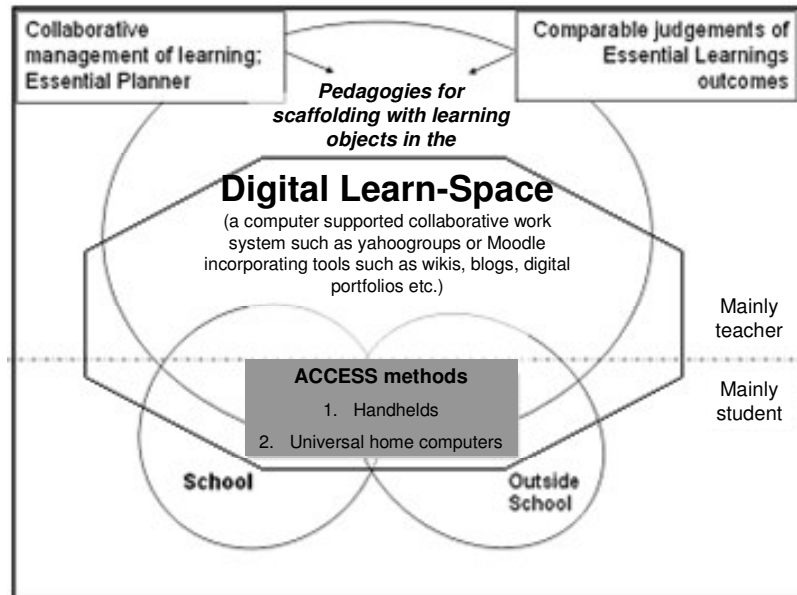


Figure 1: The Digital Learn Space scope (© Robertson and Fluck)

Built into this process is the need for cooperation and negotiation between teachers involved and equally with the students involved. Our hunch is that using handhelds will provide students with the motivation to engage more frequently with the learning content and quite possibly enhance their understandings through exchanges with their peers. However, at the time of writing all this remains conjecture.

Conclusion

Perhaps the most apt conclusion is that there can be no conclusion when it comes to the integration of digital learning devices and strategies. The need for constant renewal of ideas is part of the reality of daily life. Preparing young people for the changes they will face in their lives needs to incorporate skill building in resilience for change and competence in negotiation within what are likely to remain socially complex and spatially diverse societies. Place and space relationships are likely to provide one of the key dynamics for educational reform in the future. But we need to be planning for the future – rather than reacting too late. The skateboard needs oiling!

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As this paper is a personal compilation of ideas and selective excerpts from research I have chosen to submit the paper in my own name. However, I do wish to acknowledge

⁴ For details please contact Margaret Robertson on Margaret.Robertson@utas.edu.au or Andrew Fluck on Andrew.Fluck@utas.edu.au

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References

- Aleven, V. & Stahl, E. (2003) Help seeking and help design in interactive learning environment. *Review of Educational Research*, **73**(3), 277-320.
- Anderson, P. & Blackwood, A. (2004) 'Mobile and PDA technologies and their future use in education', report for the Joint Information Systems Committee (JISC) UK accessed at <http://www.jisc.ac.uk> on 14 Dec. 2004.
- Becta, (Brit. Educational and Technology Agency) (2003) Becta ICT Research Online <http://www.becta.org.uk>
- Bottino, R.M. (2004) The evolution of ICT-based learning environments: which perspective for the future? *British Journal of Educational Technology*, **35**(5), 553-367.
- Bourdieu, P. (1993) *The Field of Cultural Reproduction*. Cambridge: Polity Press.
- Candy, P. (2004) *Linking Thinking. Self-directed learning in the digital age*. Canberra: Commonwealth of Australia.
- Capper, P. (2001) *Report on the implementation of ICT in New Zealand schools*. Centre for Research on Work, Education and Business, Wellington, New Zealand: Web Research.
- Chapuis, L. (2000) Rethinking the computer lab model. *EQ Australia*, 21-22
- Dellit, J. (1998) *All Knowing: Creating the Knowledge Society from the Information Economy*, EdNA Online Project, available at <http://www.edna.edu.au>. Accessed July 2004.
- DEST (2000) *Learning for the knowledge society: An education and training action plan for the information economy*. Online at <http://www.dest.gov.au/schools/Publications/2000/learning.htm>
- Foucault, M. (1970) *The Order of Things an Archaeology of Human Sciences*. Trans. By Les Mots et Les Choses (1994), New York: Random House, Inc.
- Foucault, M. (1997) Governmentality. In C. Gordon & P Miller (Eds) *The Foucault Effect: Studies in Governmentality*. Chicago: Chicago University Press, pp. 87-104.
- Hargreaves, A. (2003) *Teaching in the Knowledge Society*. Maidenhead: Open University Press.
- Ivarsson, J. (2003) Kids in Zen: computer supported learning environments and illusory intersubjectivity. *Education, Communication and Information*, **3**(3), 383-402
- Joinson, A. (2003) *Understanding the Psychology of Internet Behaviour*. New York: Palgrave Macmillan.
- Kearns, P. (2002) *Towards the Connected Society*. Canberra: Commonwealth of Australia
- Kent, N.& Facer, K. (2004) Different worlds? A comparison of young people's home and school ICT use. *Journal of Computer Assisted Learning*, **20**,440-445
- King, K. (2002) Educational technology professional development as transformative learning opportunities. *Computers and Education*, **39**,283-297.
- Lake, D. et al. (2004) *Field Review of the Schools Online Curriculum Content Initiative*. Perth: Murdoch University

- Lefebvre, H. (1991) (trans. d. Nicholson-Smith) *The Production of Space*. Oxford: Blackwell Publishers Ltd.
- Mathews, R. (2004) Psychosocial impact of mobile phone use amongst adolescents. *Inpsych*, December.
- OECD (Organisation for Economic Cooperation and Development (2001) *Learning to Change: ICT in Schools*. Paris: OECD.
- Oldknow, A. (2001) Let's integrate: hand-held and conventional ICT. Assoc. for ICT in Education, UK. Online at <http://www.g2fl.greenwich.gov.uk/acitt/resources/pubs/Integrate@2031/calcs.htm>
- Peters, O. (1999) *New Learning Spaces*. , Silkeborg, Denmark: tbc Consult & Fernuniversitat Hagen. Online at http://www.tbc.dk/pdf/peters-new_learning_spaces.pdf on April 11, 2005.
- Robertson, M., Grady, N., Fluck, A., & Webb, I. (2006) Conversations Toward Becoming an ICT School. *Journal of Educational Administration*.
- Robertson, M. & Fluck A. (2004a) Capacity Building in Geographical Education: Strategic Use of Online Technologies. *Geography*, **89**(3), 269-273.
- Robertson, M. & Fluck A. (2004b) Online learning and authentic teaching. *Directions in Education*, **13**(5), 3.
- Robertson, M. & Fluck, A. (2004c) What makes a good Learning Object? Refereed conference paper presented and published electronically by the Australian Association for Research in Education, Melbourne, December. See www.aare.edu.au
- Robertson, M., Fluck, A., Webb, I. & Loechel, B. (2004) Classroom computer climate, teacher reflections and 're-envisioning' pedagogy in Australian schools, *Australian Journal of Educational Technology*, **20**(3), 351-370
- Robertson, M.E. (2002) Connectedness and self meaning. In R. Gerber & M. Williams (Eds) *Geography, Culture and Education*. Dordrecht: Kluwer Academic Publishers Ltd., pp.77-92.
- Robertson, M.E. (2004) Manually dextrous and symbolically challenged: Learners as teachers. In W.A. Kent, E.M. Rawling E.M. & A. Robinson, (Eds) *Geographical Education: Making Sense of a Shrinking World*, Glasgow: IGU
- Robertson, M.E., Fluck, A. & Thomas, S. (2001) In search of new meanings and rules: A qualitative approach to learning with new technologies. *Australian Educational Researcher*, **28**(1), 147-167
- Rosas, R. (2003) *MLearn 2003*. See www.mobilelearning.cl. Accessed March, 2005
- Savill-Smith, C & Kent, P. 2003, The use of Palmtop Computers for Learning: A review of the literature, accessed at ERIC #ED481345 on 1 December 2004.
- Trewin, D. (2002) *Measuring a Knowledge-based Economy and Society*. Canberra: Aust. Bureau of Stats.
- Vahey, P. & Crawford, V. (2002) *Palm Education Pioneers Program*. Online at www.palmgrants.sri.com. Dec. 1, 2004
- Webb, I. Robertson, M. & Fluck, A. (2004) ICT and professional learning: Towards communities of practice. Refereed conference paper presented and published electronically by the Australian Association for Research in Education, Melbourne, December. Online at www.aare.edu.au
- Wenger, E. (1998). *Communities of Practice*. Cambridge: Cambridge University Press.
- Windschitl, M. & Sahl, K. (2002) Tracing teachers' use of technology in a laptop computer school. *American Educational Research Journal*, **39**(1), 165-205.

Yelland, N. (2001) Teaching and learning with ICT for numeracy in the early childhood and primary years of schooling. Report prepared for DETYA. Online at www.dest.gov.au. Accessed January 2005.