SUPPORT DOCUMENT

Using information and communication technologies in adult literacy education: New practices, new challenges – Support document

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Preliminary remarks

When we initiated a study of the new literacy practices associated with the use of ICT and the implications for adult literacy education, reflections on the accelerating and profound changes to the nature of literacy, communication, technology, work and training were inevitable. We begin this review of the literature with some of these reflections.

Beyond word and tool

The boundaries between literacy and technology are dissipating. The fusion of previously discrete modes of communication and their transmission is well advanced and directly challenges our notions of what should be taught in adult literacy programs. The first sign that such changes were occurring emerged in the 1990s when the pluralisation of terminology related to social practices became commonplace (Street 2001; Baynham 2003). The term literacy was replaced with 'literacies' in response to evidence that competence in reading and writing print materials did not automatically transfer to competence in other communication practices. Not surprisingly, the sense that literacy is plural is now accompanied by a sense that numerate capability is also plural.

Accompanying the pluralisation of the terms was the recognition that both literacy practices and most kinds of numeracy practices are 'situated', meaning that they occur within social networks of communication. This understanding challenged the previously popular notion that they were the isolated skills of autonomous individuals (Barton, Hamilton & Ivanic 2000). Recent projects and research in adult literacy education reflect these understandings (Shore 2003; Flak & Millar 2001; Watson, Nicholson & Sharplin 2001).

Such observations help explain why accounts of literacy have become increasingly complex, different indeed from the prevailing belief that literacy simply involves encoding and decoding verbal and written language. Because literacy is not a skill which is endlessly portable between domains and tasks, individuals have variable literacy capability: they have more in some literacy activities and less in others (Collins 1995). As a result, the old assumption that literacy is a singular skill, permanently available to those who gain it, is no longer tenable.

Instead, we know that different fields of knowledge, and different modes of communicating information, deploy their own internal literacy conventions. These particular literacies are not static over time, and literacy conventions are prone to rapid change, especially those associated with the use of information and communication technologies (ICT). It follows that as different discipline areas have their different 'literacies', it is not only difficult but also unhelpful to separate 'literacy' from its field of knowledge and to teach it in a program of its own. While some literacy skills do indeed transfer from area to area, a considerable amount of literacy learning is involved in individual knowledge fields. The result is that literacy needs to be taught in each new educational endeavour.

In addition to these observations about literacy practices, researchers and teachers concerned with the educational, occupational and citizenship consequences of literate capability often point out that literacy involves a critical disposition: an awareness of how texts position readers and writers (Fairclough 1995). Exercising informed citizenship, or participating in the consumerism of daily life, continually raises this challenge: the need to be critically aware that texts are not neutral and benign.

We need to interpret not only the formal messages communicated in texts, but also their ideological content. In the textually saturated social, economic and political context of contemporary life, the quality and depth of engagement and participation are affected by our levels of critical awareness (cf Lonsdale & McCurry 2004).

Compounding these observations about the nature of literacy is the historically unprecedented impact of instantaneous electronic communications. ICT are deeply dependent on literacy and each technology makes a unique demand on the literacy skills of users. Furthermore, over time the separate technologies which mediate the digital revolution converge with each other and this process also has a major impact on what counts as literacy: mobile telephones, with voice and text transmission, increasingly carry images; computers increasingly transmit combinations of images, moving and still, and allow users to operate a multitude of coding and accessing modes (handwriting, voice, type, multiscript and images).

Formerly separate systems are becoming combined so that different modes of communication and their meaning-making systems are now integrated into complex systems that depend on ever-more complex literacy practices. The intensification and rapidity of these developments make it practically impossible in some areas to distinguish the boundaries between literacy and technology so that we now talk about 'technoliteracy' (Lankshear & Snyder 2000). This fusion of contemporary communications produces multimodality as the emergent norm of literate practice, in which language, image, music, sound, texture and gesture, as well as other semiotic modes, diversify the meaning-making channels available to us.

Notwithstanding the considerable support offered by new media to individuals for whom verbal or print literacy was difficult, it is not surprising that individuals whose literacy capabilities varied significantly in relation to traditional literacies should vary even more in relation to the complicated demands associated with the use of ICT. Literacy and technology are so inextricably connected that failure to recognise the connection in adult literacy education is ultimately disadvantaging.

Beyond human and social capital

While the dominant view of education and training policy today is governed by the belief that investments in education constitute an investment in future economic prosperity, for individuals as well as for the nation, the rates of return and the specific relationships between education and the marketplace are far from straightforward. Few people still believe that societies are prosperous solely because they are well endowed with raw materials or have abundant primary produce. Endowments of 'physical capital' are a declining part of many national incomes.

During the early 1950s, economic theorists devised an explicit connection between learning and prosperity encapsulated in the term 'human capital'. Put simply, human capital is the knowledge that individuals acquire and use to produce goods and services (OECD 1996, 1997, 1998). Human capital as a concept has come to dominate thinking in education and training systems throughout the world. Developing nations are advised by international agencies that learning is the key determinant of economic success, and developed nations are committed to moving their economies into the knowledge age. The link between human capital and income was perhaps expressed most succinctly by British Prime Minister, Tony Blair (1997), when he said: 'In today's world there is no more valuable asset than knowledge. The more you learn, the more you earn. It's as simple as that. Education is an economic imperative'.

Human capital counts because from the early 1980s the output from the world's science and technology systems has doubled in seven-to-ten-year intervals. This corresponds to annual growth rates in human knowledge of about 10 per cent every year. As a result, some countries have directed their investment towards their people, so that in 1987 in Germany, Sweden and the UK, total investment in intangible capital (research, education, software etc) exceeded the total investment in tangible capital (buildings, railways, bridges and roads).

These tendencies encouraged the OECD to embark on a series of international comparative statistical surveys which included the International Adult Literacy Survey of 1996 (OECD 1997). Conceiving of knowledge as human capital, the belief that education confers direct and major advantages underlies education decision making in most societies, developing and developed alike (Mbida-Essama 2002).

Although the OECD and other major international agencies have from time to time conceded that literacy education is justified as a priority for minimising social disadvantage, and for bolstering citizenship and social cohesion, their focus has been on building human capital. Informed by their understandings of literacy as socially grounded and situated, it has been left to researchers, educators and students to invoke the rival notion of 'social capital' (Falk 2001). Essentially, the proponents of social capital argue that for an economy to function at all it needs secure basic social conditions, a measure of social cohesion, community solidarity, and trust between people and between people and their institutions (Bourdieu 1998; Putnam 1995; Woolcock 1998).

These social conditions are themselves grounded in effective communication, and assume levels of understanding and cooperation between people. Individual knowledge is generated socially, and we cannot separate learning from the human context of our social and emotional life. Knowledge mostly arises from dialogue – whether that is with a writer's thoughts in a book, or in team work in a laboratory, or in a tutorial at a university (Barton, Hamilton & Ivanic 2000). Social capital tells us that no matter what their resource levels, great or small, societies mired in conflict, lacking public confidence in institutions, and with an eroded sense of community, are always dangerous and wracked by upheaval. The shared norms and values among members of society – norms and values that only come about in the first place through dialogue and communication – allow communities to cohere socially and economically.

Social capital, however, has also been critiqued. Social capital cannot account for the fact that the global economy is based on massive diversity. Since the mid 1970s, there has been vast population mobility, as many millions of people have left their places of birth to live elsewhere. Contemporary life in many countries is multicultural and communication practices are deeply affected by the diverse assumptions that underlie different literacy traditions. While social capital suggests a need for cohesion, it is clear that societies are becoming more diverse, comprised of groups who have different and sometimes incompatible kinds of social capital.

More recently, Florida (2002) has introduced a new notion to the connections between education and economy: 'creative capital'. As the global economy links urban spaces and individuals across national boundaries and social categories, argues Florida, creative people aggregate, attract investment and then transform local economies and their environs. For Florida and others who work with the notion of creative capital, this new class of productive workers is the future driver of prosperity. They form a class of culturally, linguistically and in other ways diverse people: artists, teachers, scientists, engineers and architects. Thousands of such highly mobile, educated and cosmopolitan people propelled the US economy during the 1990s, in high-tech sectors based on links between education, research and innovation, often located near universities or in them, all with multicultural workforces.

The theory and research presented here suggest that a combination of human capital (or economic capital), social capital (cohesion and trust) and creative capital (diversity and talent) is required for prosperity in global, multicultural and high-tech future societies. A productive economy builds on a strong foundation that acknowledges: social and linguistic diversity as economic and cultural resources; technology as a key driver of future economic prosperity; and literacy, or, rather, 'technoliteracy', as the critical means to access and participation.

Literature review

We frame the review of the literature with some telling statistics (Australian Bureau of Statistics 2003, 2004). These data show significant increases in Internet-sourced work across Australia in recent years, demonstrating the extent of workplace mediation by the use of new technologies. This is important because adult literacy education prepares people, both directly and indirectly, for the workforce. Overall, 83 per cent of Australian businesses used a computer and 71 per cent accessed the Internet during 2003 (Australian Bureau of Statistics 2004). The percentage of households with computer access has also been growing, albeit relatively slowly, from 44 per cent in 1998 to 61 per cent when last counted in 2002 (Australian Bureau of Statistics 2003).

The growth in both computer use and Internet access is being driven mainly by growth in Internet access at home. Between 1998 and 2002, the percentage of households with access to the Internet at home rose from 16 per cent to 46 per cent (Australian Bureau of Statistics 2003). In the context of the burgeoning entry of sophisticated communications technologies into the privacy of homes, it is likely that the blurring of the boundaries between work, education, training and the domestic sphere will continue to accelerate.

This review acknowledges these developments and restricts itself to a tight selection from our extensive reading and analysis of a 20-year period of theoretical, empirical and policy studies that have examined the relation between the use of ICT and literacy (especially adult literacy) education. The basis of the selection is the general framework of the present study: *new practices, new challenges*. Existing surveys of the literature are referenced to provide an anchoring in a broad chronology, but the bulk of the material presented is organised around emergent and promising practices and present and predictable key challenges.

Noticing the technologies

As Bruce observes, we do not typically 'notice the technologies of literacy because we treat our literacy technologies as natural and inevitable' (Bruce 1998, p.47). Literacy, however, always involves some kind of technology. At any particular time and place, literacy is necessarily related to the technologies that are locally available, so that literacy and technology are interconnected. This means that written language is always technologised, only coming into being through the available technologies of information and communication. Some of these we do not often think of as technologies, such as marks or scratches made on natural surfaces, the alphabet itself, and other symbol systems, the stylus or pencil, the printing press, and, today, the 'digital-electronic apparatus' (Bigum & Green 1992; Snyder 1996). Such technologies, however, 'encode' language, making it possible to symbolise speech.

These insights also serve to emphasise some of the reflections about literacy presented earlier. If literacy is always changing, and is influenced by different contexts and applications, then it cannot be assumed that once acquired literacy will remain appropriate, and sufficient, to new settings, tasks and contexts. It follows that different learning tasks and technologies will contain or impose new and distinctive literacy demands on users, which will be best and most effectively taught in the context of using that new technology, or participating in the new tasks. From an historical perspective, it becomes clear that as technologies change, people apply and adapt existing literacy skills in different ways to accommodate the changes. As with other social practices, successive advances in technology have extended the boundaries of the literacy that were previously possible

and each technological advance provokes a corresponding change in how we practise literacy and understand its social role.

However, despite the emergence of these new ways of practising and thinking about literacy, literacy education remains much the same enterprise it has always been. Literacy education continues to involve students learning and using old skills, but applying them in new ways via new technologies and new media. The resources required for literate capability – cracking the code, participating in the meaning of texts, using texts functionally and analysing texts critically – are as important for literacy teaching under the influence of ICT as in less ICT-intense teaching of literacy (Freebody & Luke 1990).

New challenges and old challenges in new forms

It is increasingly important to see that print is just one medium of literate practice within an entire range of available media. Further, these available media are not neutrally distributed. For centuries, print, and within the print mode, some types of writing, have predominated over others. This 'old' arrangement of the literacy forms is undergoing major transformation. Durrant and Green (2000) have described this transformation as a broad-based shift from print to digital-electronics as the organising context for literate-textual practice and for learning and teaching. This shift does not mean that the old modality, print, will be displaced. Indeed, the forecasting of the death of the book has been exaggerated. However, the traditional forms of print, the book and the letter, have been altered, and new textual forms have come into prominence. As a result, more flexible and expansive views of what constitutes literacy are required.

With the collapse of past divisions between modes of literacy and the contemporary integration of multiple modes of meaning making including writing, moving images, sound, graphics and colour, new literacy practices are increasingly required. These changes to literacy practices have important implications for adult literacy education. Assessing achievement and learning in these new and dynamic literacies is a challenge already facing many educators today. Imparting a critical awareness of how these new and complex literacies position people – the economically disadvantaged, the elderly, the disabled, those with restricted access to the enabling technologies, those actually disadvantaged by the operating mechanisms of some new technologies, marginalised and oppressed populations – is an even greater challenge.

Albrecht (2001) cautions that ICT and multimodal literacies depend still on a critical disposition, more so perhaps than with the print paradigm. An endemic aspect of the information age, in economic, social and political life, is not an absence or a shortage of available information to support decision making, but an excess of information. The key task becomes how to organise, interpret and manage this information. More and more, citizenship and public participation will require skills in resisting pervasive propaganda, relentless advertising, in being able to exercise judgement, and in locating relevant information, guided by appropriate frameworks of knowledge and wisdom.

Not surprisingly, perhaps, the research literature dealing with the use of ICT in literacy education increasingly identifies sharp challenges facing literacy teachers. These include the enduring educational and social issues of fair and reasonable access and equity, and opportunities for designing and shaping the future in the more complex context of ICT (Kress 1995), rather than only taking account of changing circumstances and conditions of literacy. In addition, technologised literacy, or more deeply technologised literacy, also represents a challenge, not merely in terms of how it affects people, but how wider segments of the population can be empowered to make productive use of the potential of the technologies. In the words of Schneiderman (1997), it isn't just a matter of helping learners to 'surf the net but [to] make waves'.

Digital divide revisited

We know a lot about many different aspects of the intersections between literacy, learning and technology. Digital literacy practices have been studied extensively in general terms (eg, Snyder 1997, 2002; Burbules & Callister 2000; Lankshear & Knobel 2003). Multimodal literacy has been explored from many angles, including its teaching implications (Cope & Kalantzis 2000). The variability of literacy has been examined internationally by researchers working under the umbrella term, the New Literacy Studies (Gee 1996; Street 1993, 2003), greatly extending current understanding of how literacy operates in diverse social settings. While these formulations offer imaginative and empirical perspectives to enrich the understanding of the use of ICT in education, there remains a shortage of specific examinations of adult basic education. When issues of advantage and disadvantage are considered, it is usually under the banner of the term, 'the digital divide'.

Warschauer's (2003) thinking about the digital divide is of particular relevance to adult education. He identifies a kind of literacy that he calls 'computer-mediated communication literacy'. Warschauer defines it as the capability of creating, managing and participating in online communication using a diverse range of formats and genres. This literacy dissipates the temporal separation typical of writing, in which a written text is not 'consumed' immediately, as is speech, but is read and consumed later. Chat groups are an example in which we see a collapse in the disparity between the speech paradigm, in which there is a high degree of interactivity and shared meaning making, and writing, in which there is more distance and less immediate interaction. Given that many people use the Internet for chatting and 'cyber shopping', it is possible to see that technology usage does not necessarily require reading to any great extent.

Although, as Warschauer argues, technology shapes how we practise literacy, it remains the case that literacy can act as a gatekeeper for accessing technology and using it fully. For Warschauer, the famous digital divide is less a kind of division between access to computers or lack of access to computers. According to his analysis of advantage/disadvantage, the digital divide is not so much a hardware and access question as literacy question. It represents a division between differential access to the range and depth of semiotic tools to use fully and productively the resources and power of online and technology-mediated knowledge. Lacking these tools results in only 'pre-packaged' menu alternatives being available. Variation in ability to make maximum use of technologies is essentially a literacy issue.

In developed countries, ICT access and usage, especially to Internet resources and power, is segmented according to socio-economic status, income, gender, education level, age, geography and ethnicity (Warschauer 2003). Disadvantaged social groups are not only less likely to use such technologies, but disparities in access are increasing, and, more importantly, the ability to use available computing is significantly unequal. The consequence is that even if access can be improved it is unlikely that the divide will be lessened because the literacies required for productive and maximal use are not being made widely available.

Using ICT in literacy learning

An important contribution to the literature is Andrews' (2004) systematic analysis of the relation between ICT and literacy. Despite its focus on the compulsory school years rather than adults, and its concern with the *impact* of ICT *on* literacy learning, which represents a limited way of looking at a complex relationship, this survey traverses some similar territory to the considerations of the present report. As a result, it offers helpful reflection on the coming together of the domains of ICT and education. The review concentrates on five areas:

- ✧ The relation between ICT, literacy learning and learners whose first language is not English
- ✧ The impact of ICT on reading and literature in general

- ✧ The relation between ICT and the moving image
- ✧ Outcomes evidence on the effectiveness of the use of ICT in literacy learning programs predominantly drawn from experimental studies
- ✧ The specific impact of 'networked ICT' on literacy learning

Andrews' analysis of the learning effects of applying ICT in literacy teaching concludes with a mixed set of findings. A number, however, have particular salience for our study. For some learners, ICT bring no improvement in educational outcomes. Given the prevailing public policy expectation that the use of ICT leads to enhancement in the quality of educational outcomes for both adult and child learners, it will require a new mindset to view the relentless advance of communications technologies as not necessarily improving educational outcomes in its wake.

Even more remarkable, Andrews concludes that in some instances educational practices and learning are made worse. The sense that often prevails among those with strong enthusiasm for technology is that teaching can more closely target the needs of individual learners, that curriculum can be diversified and enriched, and that different teaching styles can be catered for. Andrews' survey provides an important corrective to excessive technological optimism.

As a caution against unthinking confidence in the promise of technology, Andrews proposes that randomised trials should precede further investments in ICT for literacy education, and that policymakers and literacy teachers should be alerted to the reality that non-ICT methods are, at the very least, as effective as ICT-infused teaching in promoting literacy learning.

However, Andrews' belief that 'rigorously designed' randomised trials evaluating the impact of ICT on literacy learning across all age groups will attach 'scientific' evidence to direct future policy settings may be too hopeful. It is just as likely that systematic research evidence may be unable to assist in resolving choices around public investment given that fraught issues of public policy, such as the degree of investment required by public authorities in ICT-mediated literacy education, are rarely amenable to resolution through research.

When summarising the studies that have investigated the relation between ICT and moving images, Andrews (2004) reports several empirical studies that suggest a beneficial effect on print literacy of engagement with digital moving media. A number of these studies contribute to theory building about multimodality. He points out that engagement with the moving image is relevant to both writing and reading. He also finds that such engagement necessitates a more vigorous style of teaching than mere investments in hardware or software.

In addition, Andrews' review finds that ICT can affect positively social interaction among learners in the context of literature-related literacies, but probably because the use of ICT is mediated by teachers. A similar conclusion is reached in connection with ESL learners. For these learners, English literacy acquisition was enhanced when the ICT had a specific and identifiable pedagogical function, rather than a random application. The overall conclusion – that teachers are more important as facilitators 'under the influence' of ICT than without them – may not be generalisable but it coincides with the findings of our study and lends weight to the observations of teachers in Australian adult literary programs.

As far as specific technologies are concerned, Andrews (2004) reports that speech synthesis and word-processing functions of ICT have had the most positive consequences for literacy teaching, that Computer Assisted Language Learning typically supports more code centred and lower levels of literacy development best, and that non-ICT-mediated educational practices are in no way inferior to ICT based or ICT influenced literacy teaching. However, because there are few non-ICT using classrooms to compare with ICT-mediated teaching, experimental research designs provide little practical guidance to educational improvements.

Despite some reservations, Andrews' comprehensive and thorough review is useful. In keeping with Andrews' study, the present project is informed by the understanding that the use of ICT, in and of itself, is unlikely to produce significant educational enhancements in literacy acquisition. It is

also informed by the understanding that experimental research designs do not capture the complex, interactive and iterative character of literacy learning and teaching. A carefully designed qualitative approach with quantitative dimensions – in other words, a mixed method approach – is more likely to provide an appropriately nuanced picture of what happens when ICT are used in adult literacy education.

From New Zealand, Parr's (2003) review of the research literature on computer-assisted language learning (CALL) is also useful, providing support for Andrews' more substantive study. Commissioned by the Ministry of Education, the review focuses on learning outcomes. Parr concludes that learning cannot be demonstrated irrefutably and, indeed, that CALL is generally accompanied by lingering mastery acquisition theories of learning. These include some approaches that recall rather narrowly focused psychologically oriented practices, sometimes reintroducing superseded literacy teaching techniques into classrooms in which non-ICT based teaching had progressed to more inquiry-oriented pedagogies. Parr finds that in New Zealand primary classrooms the practices of teaching reading favoured by learning software are widely discrepant from accepted classroom pedagogies and generally lead to inferior learning outcomes. The one area where more positive outcomes were found was in mathematics, though it appears that enhanced procedural knowledge was unlikely to be generalised to school or system-wide curriculum assessments.

And from Spain's Canary Islands, but linked via European Union funding to Scandinavian research, the Virtual Network for Adult Education (RedVEDA) reviews the integration of Internet resources in adult school settings (Area 2002). Involved in training 43 teachers to use new technologies, the network produced 15 different sets of multimedia materials for adults, trained teachers in the use of digital resources for adult education, and designed and managed a project website. The project is interesting because in the context of the Canary Islands, even as late as 1999, there was no previous experience in the use of Internet resources and online courses in adult education, whereas the Swedish and Finnish partners were relatively well versed in these areas. Despite achieving many of its aims, the project has faltered.

These two studies, from New Zealand and the Canary Islands, serve to strengthen the point that technologies reflect and follow human demand, interest and propensity as much as they drive them. To fully appreciate the changes that the use of ICT introduces into adult education systems, and to assist in spreading competence in the management of the literacies that govern their use, social and cultural analysis as much as technical mastery is required. Accordingly, we paraphrase Locke and Andrews' (2004) questions about ICT and literacy:

- How best can educators utilise ICT to achieve teaching/learning objectives that are socially and culturally empowering?
- If ICT are changing the nature of literacy, how can control, mastery and pedagogy attached to the new literacies be incorporated into classroom teaching?

A brief chronology of research is useful, if only to remind researchers, policy makers and practitioners to be cautious about ensuring that past failed practices are not repeated. During the late 1970s and 1980s, researchers conducted examinations of classrooms aiming to control naturally occurring social and cultural variation and isolate the influence of ICT on learning. It is fair to conclude that many researchers came to recognise that such control is not ultimately possible: a common outcome of attempts to produce 'laboratory' like conditions is to generate 'results' that are trivial or non-transferable (Snyder 2000).

New directions

Recent work in the area of adult literacy and the use of ICT presents a range of important understandings and insights. In the Australian context, Miller and Falk (2000) investigated how literacy can be best provided for groups with special needs. Addressing the learning requirements of

older rural Tasmanians, Miller and Falk studied the potential of online technologies 'to foster local literacies and community well-being', finding that access to online technology materially assists ageing rural communities to deal with deep social and economic transition. In communities with a declining economic base, with age profiles depleted due to out-migration of young people, and struggling to retain a semblance of productive economic life, enhanced access to the Internet can bolster community sustainability, provide needed training, and initiate lifelong learning practices.

Farrell and Holkner (2003) argue that more and more workplaces are no longer 'places' as such, preferring to call them 'hybridised workplaces'. Made possible by the use of ICT, these new workplaces operate according to non-geographic principles, connecting participants via networks. The researchers examine the effects such workplaces have on the use of language and literacy amongst employees and identify the vulnerability of texts to become lost or misinterpreted as each individual cultivates individual communication norms and is selectively dependent on different technologies. The researchers suggest that literacy education should aim to build communities of shared understanding when new technologies are used so that the erosion of workplace communication due to the effects of ICT is ameliorated.

In a similar vein, but focusing on a different dimension of literacy, Waterhouse and Virgona (2004) specifically address the VET system in Australia: the use of literacy in aged-care facilities and call centres. This study highlights some very effective training but cautions that there is a temptation to limit the literacy and generic skills taught to those applicable in particular workplace settings. For Waterhouse and Virgona, this would be counter-productive since the workplace literacies are narrower than those required in wider society and such targeted literacy teaching has been found in the past to be ineffective in enhancing literacy functioning.

Peters and Lloyd (2003) investigate demand for online VET delivery and the key factors that influence how this demand is manifested and determine its characteristics. Students undertaking training to enhance, or change, careers or generally to improve their skills, and people who are self-employed are the categories most likely to favour the delivery of training by online means. The strong association of demand for online education delivery with career specific goals should not be confounded with a narrowing of literacy teaching to support such online learning. This caution emerges from all of the previously reviewed studies.

Although it focuses on K-12, a major study of more than two decades of US public policy on the use of ICT in education, conducted for the US Department of Education, has implications for education broadly conceived, including the adult sector (Culp, Honey & Mandinach 2003). The analysis of key policy reports over the critical period of accelerating technological change, the mid-1980s to the present, addresses the integration and application of technology in education.

A very early but decisive US policy document, the 1983 report, *A Nation at Risk,* by the National Commission on Excellence in Education, established a solid platform of including social and communication issues within thinking about technology. The report envisaged that all high school graduates should understand computers as 'information, computation and communication' devices and that they should learn to use the computer as a tool for 'personal and work-related' purposes. This represented an expansive approach to the use of ICT in educational contexts, in contrast to the tendency for reductionism in the scope and purposes of computer related learning. The report connects technical and technology aims closely to communication and community-based objectives. The report also recommended that learners 'understand the world of computers, electronics, and related technologies', anticipating a critical approach to the consequences of technology in society as a likely future direction in ICT-mediated literacy education.

Culp et al (2003) also address the most recent major report in general education, the American *No Child Left Behind Act* (Elementary and Secondary Education Act 2001). This act advocates that all eighth graders should be technologically literate, emphasising the importance of general educational technology for all levels and aspects of schooling. It constitutes technological literacy as 'a basic', but without the breadth of *A Nation at Risk*, the act has adopted a more instrumental view of the relation between education, literacy and ICT. Culp et al also cite *Partnership for 21st Century Skills*

(2003) which supports and extends the *No Child Left Behind* precepts about technological literacy. New directions in ICT and literacy, however, are more widely based in *Partnership for 21st Century Skills*, vindicating the direction of *A Nation at Risk*.

A recurring theme of the US policy reports on technology is the emphasis on the economic and social transformations that have made technology skills central to the future employment of today's students and, more broadly, to the importance of technological innovation in maintaining the global dominance of the United States (Culp et al 2003). Continuing in this vein, *Learning for the 21st Century* is drawn from the stable of projects under *Partnership for 21st Century Skills* (2003). Reiterated in this report are the impact of technology on the job market, the flow of information and resources in a global marketplace, and the impact of digital technologies on daily life. In the context of the overwhelming emphasis in such documents on the nexus between the labour market and technology, and US competitiveness in a global market, it is useful to keep in mind the cautions about equitable access to the promoted technologies, and their associated literacies, and the presently unequal nature of access to and capability of using ICT in either education or labour market activity (Selfe 1999).

Policy documents repeatedly connect the specific capabilities of various technologies with recurring challenges to the delivery, management, and support of effective teaching and learning experiences. Frequently mentioned are the delivery of instruction to geographically dispersed educational clienteles; helping students gather and interpret complex sets of data for project-based investigative learning; supporting enriched, diversified and process-oriented writing projects and communication tasks; and broadening the scope and timeliness of information resources available in the classroom.

Many reports contain strong assertions that technology can catalyse much needed changes in the content, methods, and overall quality of pedagogical processes, stimulating reform to lecture-driven instruction and encouraging its replacement with reflective, inquiry-oriented practices. Many but by no means all of these and other claims made for technology in policy documents are justified, but not all would qualify as 'new directions'. Some claims, especially the last, are doubtful, given that technologies can serve to stifle innovation, or return to some superseded practices in classrooms (cf Parr 2003; Andrews 2004). Nevertheless, it remains true that the use of ICT and literacy are bound together, as writing and technology have always been, and that deep changes in what counts as literacy are increasingly being brought about by the converging technologies of instantaneous communications and these developments have a direct and major bearing on adult literacy education in Australia.

The paradox of different constructions of literacy

Literacy researchers and practitioners typically understand literacy as a situated and variable social practice. Paradoxically, policy makers and many in the wider public understand literacy as discrete and basic skills, testable, measurable and transferable from one context to another. The disparity between these characterisations results in a widening gap between policy understandings of desirable literacy teaching and researcher-practitioner understandings of desirable literacy teaching.

One outcome of this drift of understanding between researchers-teachers on the one hand and policy makers on the other has been a narrowing of the range of topics for research that are funded and the privileging of quantitative methodologies for new commissioned studies. Another outcome has been a demand in policy for greater accountability and more measurement of outcomes, using norm-referenced assessments.

The connection between evidence of literacy difficulties among the population and the provision of funding for teaching, research, curriculum development is far from straightforward (Lo Bianco 1996; Lo Bianco & Freebody 2001). Research on the effects of acquiring literacy skills is also ambiguous. Many individuals with low levels of literacy function effectively in society, employment and pursue full and active lives. Further, ethnographers of literacy have shown that literacy does not

necessarily have the cognitive consequences nor the economic and social payoffs that are often claimed for it. However, without such evidence, it becomes more difficult for literacy advocates to persuade politicians, and independent funding authorities, to invest in basic education and literacy. It is also clear that the stigma that attaches to poor literacy skills is a major and persisting one. The use of ICT is similarly complex in the gap between the various understandings of its role in personal lives and economic/citizenship opportunities.

What is clear is that the specific examples of disadvantage and inequality that result from poor literacy, and low technological literacy, are many but not universal, are serious but not for all people disabling. What is important is for research, teaching and policy to address not generalisations and abstractions in these areas, but to focus on specific settings, contexts and purposes for embarking on enhanced literacy/technology programs, to provide professional development support for teachers, and to research appropriately the site-specific needs for literacy, ICT and education articulated with the wider social setting.

'Communication' rather than 'literacy' practices

This literature review has found that the emergence of new information and communication technologies carries significant implications for literacy practices. Recent Australian research strongly endorses this claim, arguing that a new communication order is emerging (Snyder 1997; Lankshear & Snyder 2000; Snyder 2001). These writers also point out that within this dramatically changed communication paradigm the term 'literacy' is less and less useful. This is because literacy is often inscribed with reductive and narrow meanings (Snyder 2001) and, possibly worse, carries a baggage of serious social stigma for those with poor literacy. Both policy makers and teachers need to accommodate the increasingly blurred boundaries between different areas of knowledge and different theoretical perspectives: to regard 'literacy and technology studies' and 'media studies' as separate enterprises may no longer be tenable.

It may be appropriate and timely to abandon the notion of 'literacy practices' and substitute 'communication practices'. The term communication practices avoids the negative stigma associated with low levels of literacy, evident from considerable research, and from the case studies discussed later, and could serve to avert reductive notions of literacy. The term communication practices might also serve to undermine the overly close association between literacy and the printed word and focus attention on the need for enhancing understanding of multimodal communication practices intrinsic to a future likely to be dominated by screen-based reading and writing practices, rather than print-based ones.

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Part II
Case studies

Case 1: Sturt Institute of TAFE

The case-study site in a nutshell

Sturt Institute was a large public Registered Training Organisation located in an impressive set of new buildings by the water in an Australian state capital. The area was a developing hub for galleries, cafes and apartments and the other trappings of affluent contemporary urban communities and the architecture of the Sturt campus harmonised with these surroundings. However, the Institute's catchment area had been, and continued to be, an economically depressed area. Australian Bureau of Statistics data from the 2001 census showed that the average family income in the area was only $760 per week, well below the national average (Australian Bureau of Statistics 2004a). The number of individuals with access to a computer at home was 32 per cent compared with the Australian 2002 average of 61 per cent.

The educator participants

We interviewed three educators at Sturt, all of whom were over forty: we did not succeed in recruiting an educator under 40. Although we intended to interview two educators, three volunteered: Mary, Joanne and Bill. This enthusiasm for the project emerged at other sites as well. Joanne and Bill team-taught, both were in class with their learners during the learner group interviews and they arrived for the educator interview together. As in many TAFE and ACE facilities, it was difficult to find a private space in which to conduct the educator interviews. We interviewed Mary in a room off the library and Bill and Joanne together in a corner of the staff room.

Mary, originally an office administrator, had taught in TAFE for 22 years on 'an hourly paid basis' and was a self-taught user and teacher of information technology. Mary described herself as an early adapter of IT. Throughout our interview she referred several times to her lack of formal qualifications in information technology or teaching yet it was clear from speaking with her, and later with her students, that she was a passionate and engaging teacher. Mary taught a range of computer applications to access classes, which included the members of both of our Sturt learner interview groups.

Joanne, originally a primary school teacher, had been in involved in community literacy programs for 18 years, establishing remote area programs and working with adults suffering mental health problems. A largely self-taught exponent of ICT, Joanne argued that the various media available through computing provided improvements in content as well as with curriculum diversification. This allowed teachers to respond to the special needs and learning styles of individual learners.

Joanne first worked with computers in the early 1990s when 'it was decided that we needed to look at our students and do something about helping them to become computer literate so in order to be able to help the students I needed to know it myself'. Bill first used ICT in the 1970s in the automotive industry and like Joanne was a keen user of ICT in his private life including participation in a group that developed digital demand control systems for model railways.

The learner participants

We interviewed two groups of students at Sturt. In one group, all the learners were aged under 18 and this created a dilemma. We had not intended to work with students younger than 18, however, their responses provided a fascinating foil to those offered by the 'older' learners, not only at Sturt but also at our other sites. As a consequence, we contacted NCVER and the Monash Ethics Committee and successfully sought permission to include this group of young learners in our study. The educators at Sturt remained in the room when we talked with the learners, sometimes participating in the conversation.

What the educators told us

Mary observed that she had seen changes over the years in learners' receptivity to the acquisition of ICT skills which she attributed to the growing presence of ICT in society:

> Everyone is exposed to it at some point, whether it's going to Myer centre and just doing a touch screen to access to different levels … you know if you press the button it's not going to explode.

She considered that on the whole her younger students were more confident than older learners. However she qualified that observation:

> I would say that all the young people that come in do have a certain level of computer skills … as they grow up with it. So it's like second nature but it doesn't mean they do understand it fully, are comfortable with what the computer offers.

She pointed out that the younger learners attending TAFE access programs were there because they became disengaged with learning in schools. Mary considered these young people often less proficient with ICT than their peers in mainstream education. Mary clearly regarded learning as dependent on motivation, on the learners' need to know. She cited examples of this such as young people's proficiency with text messaging compared with that of older learners who think 'it's quicker to ring and speak to someone than sit there and play with those buttons'. In a further example, she described one of her adult students, a woman who was learning IT skills because she wanted to get into a community services course to become an aged care attendant. Mary described this learner enthusiastically: 'It's really quite a pleasure to have her in class because the attitude is good … she's actually absorbing at the same rate as the young people which is really nice'

Mary articulated strong views on the prevalence of ICT in society and the associated importance of acquiring generic ICT skills:

> It's like breathing … developing generic skills if you can put it that way; you know skills that you can survive in some sort of technology because you are always going to be faced with some new equipment. But having some basic skills you know you can operate to a level and then you can sort of develop further

She emphasised the importance of teaching learners computing skills that were relevant to their lives and of building on skills as they developed to maximise transference of knowledge. Mary described the importance of specific ICT to particular learner groups. For example, she observed that ICT could be important to adult learners with physical and intellectual disabilities, allowing them to compensate for lack of fine motor skills.

Mary, like other educator respondents at Sturt, spoke of difficulties she faced in teaching with ICT. She mentioned difficulties with hardware: 'The silly thing just overheats and just cuts out at a vital point'. Most of her 'frustration', however, was with the lack of suitable resources for teaching ICT skills. All three Sturt educators noted that some coordinated or centralised development or assembling of resources for teaching with ICT would have been invaluable. The lack of suitable

resources required continual teacher creativity where it would have been more productive to build on others' work.

Like most of our educator respondents Joanne was largely self-taught. Both Bill and Joanne mentioned necessity as a key ingredient in their own acquisition of computer skills. In Joanne's words: 'I wanted it now sort of thing … so I learned word-processing myself'. Joanne told us that she did most of her class preparation at home where she also pursued her genealogy hobby: 'I'm glad that we're on broadband and we don't pay by the hour … because it's nothing for me to be sitting on the Internet for six to seven hours at a time doing the family tree'.

Like Joanne, Bill also used ICT enthusiastically in his private life: 'I use text messaging a lot. How do you ever run a romance without a text?' He is a keen user of e-Bay, the Internet generally and bulletin boards for car restoration enthusiasts.

The Sturt educators were positive about their approach to ICT use in teaching and administration and about the need for learners to acquire ICT skills. Joanne explained the use of ICT in the classroom as learning tools that added variety to the class experience:

> I think if we can offer as many different types of mediums for students to learn with that is a far better way for us to go because different students respond to different things … We've got the paper stuff and we've got perhaps a bit of video stuff and then we've got the computer stuff and within the computer there is such a range of things there that students can use from word-processing to having educational programs on them.

For part of his teaching load, Bill worked closely with Joanne often team teaching their high needs classes. Joanne's sister assisted them as a volunteer for part of the week. Bill also worked at another Sturt campus and in addition was conducting assessments in industry for a pilot program placing learners with disabilities in the workplace. Bill and Joanne regarded their Institute as being 'very positive' about its use of ICT but not sufficiently prioritising the ICT experience in the adult literacy classes. As Joanne said: 'I've heard our hierarchy speak about how wonderful our computers are … and thinking my god you know you need to come into my class and just see how we cope'.

Joanne and Bill emphasised the special needs of their 'fragile' group of adult learners. They were highly critical of the impact of poor ICT equipment and ICT management policies on their learners:

> We have big problems … these machines are not maintained enough. They're in constant use and we are constantly having problems with them breaking down and not working and that is really difficult … I feel security has gone over the top with all these codes that have to be used with students having to punch in jolly passwords and all this sort of crap … they've got to change it once a month or something else. The sort of students that I work with, they can't handle that sort of stuff.

They emphasised that adult learners with low literacy faced daunting obstacles to learning in the community as well as in the Institute. These learners tended not to have access to the ICT they needed to practise skills and there was no easy solution to this. As Joanne said: 'We talk about accessing public libraries but that's very threatening for these people … to go and approach somebody about getting on a computer'.

Considering their adult learners with disabilities, Bill and Joanne saw computer-based learning as having both benefits and disadvantages, depending on each individual learner's needs. Bill described the high quality document that could be produced by word-processing as very motivating for adult literacy students. On the other hand, Joanne explained that for some learners with low word literacy, technologies such as the Internet could be confusing: 'With all that reading stuff there and all those pictures in amongst it as well and the ads and everything else; very difficult for people like that'.

What the younger learners told us

As already described, the first interview group at Sturt comprised a group of early school leavers enrolled in a 'vocational access' program at about year 10 level. This group included Michael, Matthew, Joe and sisters, Martina and Emily. These learners appeared to be more affluent than many of our other case-study learner participants and spoke confidently of their ICT experiences, the prevalence of computing in most employment, and their private access to and sophisticated understanding of ICT in general:

> Michael: I didn't get a phone until year 8.
>
> Joe: I had like a mobile and a computer in grade six.
>
> Martina: I'm getting a digital camera for my birthday.
>
> Matthew: All my life I've used my dad's computer. He works with computers.
>
> Emily: Communicating, listening to music, that sort of stuff.
>
> Martina: Everyone uses it, like every business has to have a computer and would have to have a phone. Like some jobs now, you can't just go in and apply, you have to apply over the Internet and stuff like that.

With access to computers at home for all of them, this group had excellent access compared with most of our learner groups. They appeared to have more sophisticated understanding of ICT than most learners interviewed for the project, using the correct names for software programs, etc. Not surprisingly they were blasé about using ICT. For example:

> Martina: You don't get excited about using a computer, well I don't anyway. But like you can do lots on the Internet, can send an email every two minutes for free. That way you don't have to buy stamps and write a letter. It's pretty good, and you can download heaps of shit from the Internet. It's pretty good, I like it.

The members of the group were very positive about their teachers' positive attitudes to computers and about the ICT facilities at Sturt, which they regarded as superior to those at their high schools.

What the older learners told us

This group comprised four adult learners and was more typical of adult literacy learners in adult literacy education than the other Sturt learner interview groups. The participants were: Megan, a single mother with three children including a severely physically disabled teenage son; Caroline, who had several disabilities including partial sight; Mike, who became disabled as the result of crashing a stolen car; and Jim, a single, unemployed man. All except Megan were under forty. This group provided ample evidence that poverty means lack of access to ICT. They offered examples of many small and large annoyances related to their inability to afford a computer, mobile phone, landline, Internet account, etc. As one group member, Jim, put it:

> One of the issues with technology is that when you're on a reasonable income and you can afford Internet service and providers and all that sort of thing and you can dial up and all this sort of thing and can afford to have a second phone line then technology will be so wonderful. But if you're struggling on a single income or pension or something like that, then that's going to be a real issue, you're always going to have the technologically deprived.

As ICT had become commonplace in our society, the cost of digital communication to individuals and families had grown. The learners in this group lived in a world where even an ordinary 'landline' may be prohibitively expensive. This was the case for Caroline as a result of 'a pokey problem'. Mike was reputed to be a charming and energetic mechanic before the accident which killed his girlfriend and left him badly maimed after being in a coma for six weeks. He had since become reliant on ICT, using a prepaid mobile card and text messaging to keep costs down. Mike's disabilities made speech difficult and he found it easier to communicate using a computer or text

messaging. However, his phone and home computer were both old and he did not have home access to the Internet. His wish list included a better phone and a laptop computer.

Megan's stories exemplified how it was possible to participate in the ICT world on a low income and also the tremendous struggle involved in achieving this access. Following the breakdown of her marriage, she was left with three children, no job and a 'little computer':

> I dropped out when I was about year eight or nine and I knew I had to get somewhere before Paul [son] caught me up … I realise that if I want to get anywhere and have any hope of getting back into employment or just for my own needs I need to catch up.

Megan had a disabled 16-year-old son and respite care for only one day a week. She approached Joanne about the possibility of studying mathematics and computing on that one day:

> I just eventually found Joanne and she interviewed me and told me I could do the maths here but I also wanted to do computing but I could only come in today here so she arranged for me to do computing here as well although it's not part of today's thing.

She had recently taken her first steps in word processing, Internet banking, and text messaging. Megan managed Internet access for her children and herself through a combination of using the resources at her local library and through a 'six hours a month for $6 Internet' account with her phone company. She used this time carefully to help with her children's homework and for her own needs.

The stories told by these learners resonated with deprivations and these related more to lived experience of ICT, than to employment-related needs for ICT skills and knowledge. Caroline's stories in particular highlighted the additional disadvantages faced by disabled adults on the wrong side of the 'digital divide'. She spoke of her difficulties with seeing screens on ATMs:

> I can't see very well and especially if it's a really hot day the sun is shining on the screen, it's not easy. I've lost of lot of cards because of it … that's $5 each … if you go into the bank they charge you … it costs me $5 if I want to go into the bank to find out how much money or to withdraw money.

Similarly, Caroline explained that technology reliant on users to transcribe long numbers was problematic: 'They'll give you a card you know so you can ring people up, but it's a bit long number'. As Megan said: 'Even signing forms when they come to the door with a parcel, you have to sign those little slabs now. That's even wacky isn't it!'

The use of ICT brings a new set of literacy needs. These group members spoke of difficulties with numbers, technical manuals and online instructions involved in using mobile phones, the Internet and computers generally.

Case 2: Wentworth Institute

The case-study site in a nutshell

Unlike the deprived surroundings of Case Study 1, the second site was located in an affluent and highly educated community. It was an Institute of TAFE, a large public Registered Training Provider, servicing a community where, according to Australian Bureau of Statistics figures in 2002, 78 per cent of households had access to a home computer and 60 per cent to the Internet at home (Australian Bureau of Statistics 2003). In 2002, more residents paid bills over the Internet (25%) and shopped online (22%) than in any part of Australia. Facilities at the Institute reflected the community affluence: more plentiful, more up-to-date and better maintained than those seen at any of the other case-study sites.

The educator participants

Two teachers agreed to participate at Wentworth: Katrina taught in TAFE and higher education in rural NSW before moving to Wentworth with her husband. She had taught there for four years and was enthusiastic about the range and flexibility of the adult literacy programs at the Institute and about the ICT facilities and support it provided. Jillian who was over 40 taught in various NSW schools before taking time off to have children. During that period, she and her family moved to Wentworth and when she returned to the workforce she sought work in TAFE. She had taught at Wentworth for over 10 years. Both Katrina and Jillian were early adapters of ICT: 'There was only one computer in the department and it was a security risk to leave it there over Christmas so I took it home with me'. Katrina and Jillian used a greater variety of ICT hardware and software than other participants, not only professionally, but also in their private lives, including funds transfers, digital cameras, newsgroups, email lists, and eloquently articulated the place of ICT in adult literacy education. As Jillian said: 'We really focus on computing as a necessary part of student learning'.

The learner participants

Two groups of learners participated in the study at Wentworth. Katrina described the diverse group as comprising students that had been 'kicked out of every school' in the area, as well as mature-age students, and people from non-English speaking backgrounds. The younger learners were Phillip, Trish, Viet, Vai, John and Emily. This group included two learners from non-English speaking backgrounds, who joined the class to improve their spoken English. A group of older and younger learners also participated: Rosa, Vince, Grace, Noel, Leigh and Julia.

What the educators told us

The teachers were conscious of the association between the use of ICT and changes to literacy practices and gave many examples of improved teaching, more rapid development of teaching materials and the enhanced quality of resources produced. They decried those who unthinkingly used ICT simply because they were there: 'Oh we have to put something on WebCT. They don't care what it is as long as we put something up'. Compared with other providers, these educators had had plentiful access to relevant professional development. At one time, Wentworth Institute had a 'drop in' staff development service to help teachers learn to work with ICT. As Jillian remarked:

> We had a computing teacher and IT teacher there and … as a teacher you could go in and work on whatever you really wanted to do to get some more expertise … and then of course cost cutting meant that closed down … I found that I'd got a lot of knowledge on Word and Access and Excel.

Jillian saw the changing pressures on teachers as making it more difficult for them to learn new approaches such as the use of ICT in their teaching:

> I think a lot of people would probably dive in much more readily into using computers, going online doing things, setting things up on WebCT, but it's the time factor … they keep giving us more and more administrative jobs … I think that's a real shame. The students miss out because you end up doing a job that's not as good a job as could be done.

Katrina recounted some poignant stories from her own life to illustrate the benefits that can come from good quality ICT access at home. She described how she originally thought the Internet was 'for nerdy guys in glasses' like her brother. However, when she was grieving deeply for her baby that had just died, her brother noticed that she kept going to the university library to research the condition that had killed the child. One day he insisted that she let him show her how the Internet worked and from then on, she was enthralled: 'The next day he got me a modem and hooked me up to his account through the university and I was just addicted. That was in 95'. When Katrina and her family moved to Wentworth they bought a house in an outlying suburb with little public transport and Katrina did not have a car. During this period, she found the Internet provided invaluable contact. She 'joined a list for women whose babies were due in October 1997'. This group, comprising women from all over the world, still email each other every day. Katrina belonged to a number of email groups – 'Miss Kids Pregnancy, Miss Kids Breastfeeding, Asthma, Aus.Cars' – and was a keen trader on e-Bay. She had even tried selling her house through an online real-estate site.

Jillian and Katrina acknowledged a double deprivation for learners without familiarity with ICT:

> Katrina: They're illiterate in the new literacy and it's a whole different, it's a different way of looking at things.
>
> Jillian: I think that they need to be computer literate just to be part of society … just as we teach them literacy and numeracy so that they can survive in our world.

These teachers were well aware of the usefulness of ICT for addressing the needs of learners with particular disabilities, as with one of their students who had arthritis: 'Her fingers don't work really well. It's easier for her to write that way and get it from here to there than using the pencil' (Katrina), while disabilities might in fact exclude some learners from ICT access such as 'sight impaired students [who] can't see the screen' (Jillian), and other aspects of the digital divide.

The rapidity of change in the ICT world was further evidenced here, where, partly because of the advanced resources available to teachers, awareness of what improvements or refinements were available appeared greater. For example, they expressed a desire for increased server space to permit more elaborate resource and multimedia production, and specialised computers for learners with physical disabilities.

Katrina and Jillian were both involved in community literacy programs. Jillian wrote the newsletter for the local Council for Adult Literacy and Katrina was part of a community-based project called *Digital Divide*. She coordinated a 'group of roving tutors that goes to community centres to do basic computer training'. Interestingly, Katrina described participants in the *Digital Divide* project as being reluctant to use computers in public libraries, even though such access was often mentioned in policies as providing the solution to Internet access for those on low incomes. This hesitation was also mentioned at other case-study sites and may be a particular issue for adults with low literacy and therefore little successful experience of libraries.

From her own experience as well as those of her students, Katrina was acutely aware of the benefits that online access can potentially provide for those with limited resources. She described the

relative ease of contacting government bureaucracies online compared with navigating through the usual telephone maze. Similarly, she said a woman with young children would find Internet banking much easier than struggling to the actual bank with babies in tow: 'It's a way of accessing information that they're missing out on and therefore because they can't get that information they're losing power … you know they're less powerful then they could be'.

Katrina and Jillian articulated a deep understanding of the way the use of ICT was altering literacy teaching. They described how learners can now write a first draft directly onto a computer and then manipulate the text electronically: 'You've got your blocks and you can chunk them off and highlight them and move them around and show the kids what would happen if we put the introduction here. It's not scissors and paper and all that rubbish anymore'. They saw the multi-tasking exhibited by young learners as refreshing and motivating for those students and encouraged it in their classes: 'They're doing their essay and messaging their friends. You know they have a good time and it's more authentic as to how they would be doing their homework at home and they also plug their CDs in and you know you can have them doing three things at once'.

These teachers said that their older learners were also gradually learning to enjoy the benefits ICT can bring to literacy education. For example, one older learner, a man in his sixties, brought his work on a USB memory stick to his literacy night class. An elderly woman with arthritis had found it easier to write with a computer than a pencil. Throughout the year, Katrina collected the learners' work and at the end of every semester they made a book: 'They produced it and they feel really proud of that'.

Jillian suggested that ICT can be powerful in adult literacy classes for older learners because it produced a visibly different learning environment than those they had encountered, and failed in, earlier in life: 'We're trying to get away from the fact that people have failed in this system before. If we can make this system look different, be different then they can feel they're starting again and we don't have to repeat the failures of the past'.

What the younger learners told us

The younger learners at Wentworth described experiences with a large variety of ICT. Trish said she came from a family which included a number of DJs. She did not use ICT for conventional literacy purposes, but played games, emailed her friends, chatted online. Similarly, John used 'the Internet for personal things, emails, BPay, checking the bank account, going online to see how much my phone bill is, just browse, play games on the computer'.

Two of the learners in this group were tertiary educated and proficient in languages other than English. Viet and Vai were in the class to learn English. Viet worked as an IT professional and he described the paradoxical experience of being proficient in the new literacy but not in the old: 'I can talk with computer; I cannot talk with the people; that is the problem why I come'. Interestingly, this learner also listened to the ABC news online as a means of improving his English pronunciation. Both Viet and Vai used the Internet to communicate with their families overseas. Viet had created an elaborate system for communicating with his elderly parents in Saigon. He had set up high-end computers at their home and at his own, complete with WebCams. He and his parents talked and saw each other in real time with good quality streamed video.

The younger learners were keen users of text messaging. As Trish said: 'The best thing man came up with. I swear to god I love text messages'. They were more familiar with technical language, for example, describing capacity in gigabytes, than was the case at other study sites. They were also more aware of what they were missing out on. Both John and Vai articulated their desire to have better ICT access. John explained that good ICT access was essential in contemporary life: 'You know, like for instance I was nominating someone for a competition [and] you couldn't do it on the telephone, they'd rather you do it on the net, so I mean I think life would be a little easier if you had the Internet'. And Vai added: 'When you like to know something just to go to the Internet, so

if you haven't got a computer you must go to the library and look around and find the right book … the computer can give you the answer really quickly'.

What the older learners told us

The older learners at Wentworth were less experienced and confident with ICT than the younger ones. For example, this group did not express the same joy in using text messaging as the younger learners had. Most of these learners had some access to ICT at home but did not necessarily know how to use it. Rosa was a middle-aged cleaner made redundant because of injury, and not familiar with the use of new technologies. She only encountered ICT 'last Monday, when I came here', while Vince, an unemployed young father, said that he did have access to a computer at home, 'but I've never used it because I never knew how, but I might now'. Ray, a former manual worker, expressed an ambivalent attitude towards computers. He used one to write good copies of his poetry and occasionally played games, but:

> that's about as far as my knowledge goes, like all these what do you call it, Internet stuff … I used to be a very hard physical worker and I always good that way you know so this idea of sitting down at a desk and pressing buttons is very confusing way of things.

For all Wentworth learners, the 'wish list' was simpler and similar to that expressed at other case-study sites: 'I haven't got a computer; wish I did; can't afford one' (Phillip). Even in relatively privileged environments, there was deprivation. Among the learner participants at Wentworth, only 42 per cent had access to home computers, only 33.3 per cent had home Internet access, and only one participant reported transferring funds over the Internet compared with the overall figure of 25 per cent for their city However, compared to learners at the regional site and the more disadvantaged site in another state, learners here reported using a greater variety of ICT, including banking, online shopping, job hunting, computer-based DJ applications and WebCam communication.

Case 3: Extractive Industries WELL program

The case-study site in a nutshell

Site three interviews were conducted during breaks in the delivery of a Health and Safety program to quarry employees among whom were labourers, managers and office workers. Australian Bureau of Statistics data show that home use of computers and associated technologies is lower in regional areas compared with metropolitan (Australian Bureau of Statistics 2003). However, Australian Bureau of Statistics studies also show that there is little difference in business use of IT between regional and metropolitan areas (Australian Bureau of Statistics 2004b).

This WELL funded program was an adult literacy program embedded in an occupational health and safety course. The training was located in a 1950s Rotary Hall, a modest cream-brick building with an adjoining kitchen, in a regional city in Victoria. The hall was heated although the kitchen area, where the interviews with the educators took place, was not. During our visit we observed learners seated at tables in a U-shape, with the trainer at the front using PowerPoint to deliver his presentation.

The educator participants

At Extractive Industries, we interviewed two educators aged over 40, George and Elaine. George began his employment in the quarry industries as an electrician and then moved into electrical engineering. As there were no formal courses available in the 1980s on Health and Safety, in which he had developed an interest, he returned to study to do some business courses. He did consultancy work on Health and Safety for a while before going to Canberra to design the new safety standards for offshore oil and gas rigs, and then returned to consultancy work. He had trained 8,000 people over the past 12 months. Elaine graduated as a History and Language teacher but got into Communication Skills because she 'loathed teaching in high schools'. She began teaching Communications in the 1980s. With a lot of industry experience, she learned 'on the job'. She explained that when you're thrown into a new industry sector, 'a lot of things you start thinking that you're going to do, just change completely'. Although she regarded her training as not 'wildly adequate', on other occasions, she realised 'what experience I didn't think I had'.

The learner participants

The learner interview group comprised six people whose ages ranged from 26 to 65: Veronica and Phil, a husband and wife in their early forties; Greg and Max, a 65-year old father and his under 40 son; Nick who was 29; and Iris, who was in her late forties

What the educators told us

Elaine was careful to describe herself as a 'communications' teacher rather than a literacy expert: 'It was a case of getting them to a point … talking about things like business skills, getting up and doing a presentation, things like that. It didn't involve the written skills'. She did give attention to writing in her teaching but usually business writing: 'writing memos, that sort of thing'. She

explained that in the adult education world, the word 'literacy' was used sparingly: 'It's usually kept under wraps for fear of offending, and probably with good reason, because they have a lot of embarrassed students come, admitting that they don't know very much'.

In the workplace, she sometimes found 'functional illiterates', who were 'usually young men in their twenties' for whom 'reading is a problem' as they 'don't enjoy reading and their attention spans are limited'. As trainers in the Health and Safety modules, 'we have to hide the fact that we are trying to help some people improve their literacy, but we also have to make sure that they got the Health and Safety message because that has become mandatory in the workplace'.

Elaine acquired computer skills via her own children: 'Actually I guess I taught myself as well as through my scathing offspring'. Although she admitted that her skills were not as good as they could be, Elaine realised early that 'the computer was going to revolutionise communications and it did mean that getting in touch with students and keeping that contact was important'. She regarded the increasing use of technology for communication more or less as a 'revolution in communications, especially in the professional area … It's clearly on the roll and it's not going to be turned back'.

Not surprisingly, Elaine saw children as the driving force: 'people get computers at home because of their children and the children's need for them and then decide – if my kids can do this, I'd better get involved'. She regularly used email, checked reports and downloaded programs to run the family investments.

She was reluctant to see courses such as this WELL program prepared for online delivery: 'One of the important things of people coming to a block session is personal contact with the teacher, tutor and with each other – they learn so much from each other that they will not learn on a computer'. She preferred a mixed mode of delivery with an emphasis on the visual. In Elaine's view, just as you could do literacy by subterfuge, so you could teach computer skills by subterfuge. And the rule of thumb for up-skilling should be relevance.

Elaine also taught on campus in a TAFE Institute and found that she used technological means of communicating with students in programs outside of the campus rather than within it. On campus she could have quite easily continued teaching without the use of technology. By contrast, in the training work she did in the workplace, she gave her students immediate feedback about assignments via email. Some of the learners had computers at home and access to email at the workplace – different to the quarrying industry learners. For the students who didn't have computers, she installed a fax machine at home.

With this particular group of quarry industry learners, Elaine discerned a lack of interest in computers, regardless of age. She perceived them to be 'very outdoors people. The concept of sitting down in the room wasn't terribly attractive to them'. She noted, however, that the quarry learners, usually men, had been more computer literate over the last five years: 'I remember when the first potential quarry manager rocked up to class with a PC laptop, there was a great deal of rubbishing and raised eyebrows, but within three years quite a few of them came in with their laptops and there is a demand within the department for the supply of laptops for those who don't have them'.

Elaine argued that VET institutions have a responsibility to teach computer literacy skills, particularly to the under thirties: 'For anybody going into the workforce, it is essential they go out with relevant computer skills – keyboarding, Internet access and knowledge of what's involved in using a computer'. She did not see it as so important for the older students because they chose not to use it. Elaine estimated that 70-80 per cent of students nowadays had the skills.

George's first use of a computer was in the 1980s: 'They said – there is your room, there is your computer, there is the on-switch. Can we have a detailed report of what you are going to do in the next two years by tomorrow afternoon?' So without any formal training in the use of technology, he taught himself how to word process. He knew a lot of software packages, including PowerPoint,

which he used for his presentations, and he was very technologically competent. His technical achievements included a research project for some of the trade associations where he designed 'an interactive risk-assessment tool that was an innovative drag-and-drop approach, not been done anywhere else'. This program was now being used by 5,000 tradespeople within their businesses to assist in registering assessments. In some of the longer courses he conducted, the trainees received a CD-ROM that was aimed at those who had to comply with the training requirements, but were unable to leave their offices to participate.

However, George said that at this stage using the new technologies had limitations:

> There is still a percentage of people who have difficulty with basic computer literacy. So that's a problem. There are other people who have grasped it for whatever reasons and have no problems, but there is still a number of people that as far as they're concerned, their knowledge of computers is they can turn them on and produce an invoice ... If I had a literacy program on a computer I would first instruct them on how to use the computer and put them at rest with that concept. It would have to be extremely simple because frustration would build quickly and they wouldn't respond.

In his view, the young people who took his courses would have no option but to learn how to use the new technologies. And although older people may be reluctant, they could learn things that would improve the quality of their lives and extend their experiences, particularly with Internet access. He also believed that computer skills were essential for people who run small businesses:

> Even when it comes down to things like GST taxes and all that, stuff that's hard to do by pencil and paper these days, they either have to employ someone else which means that they're earning enough money, but when you're getting solo traders, they'll find that very difficult.

As a result, George argued that VET trade-based training programs should include not only the skills dimension but also the management aspects of operating a business as part of the core of the curriculum and 'part of that should be basic computer literacy skills'. He believed that 'the success of their businesses and their ability to employ people will very much depend on their ability to use technology'.

In all situations, George told us, there had to be an incentive: 'There is no reason why a person would pick up a piece of technology and play with it unless there is an incentive to do so. You're more likely to get a better response with a face-to-face literacy program than you ever will with a computer, because locked in a room somewhere you can make more mistakes but what is the incentive to move forward?' An incentive might take the form of a monetary reward; a career path was not enough in itself, nor was the promise of the security of a job.

George used PowerPoint for his training sessions. He preferred people coming to training courses rather than providing them with CD-ROMs:

> It's extremely difficult to develop materials that suit all requirements of all users, whereas if you're face-to-face you can talk with it and put it into perspective … Unless you have a hell of a lot of knowledge to design something whiz bang you're going to get a standardised step 1, step 2, step 3. If they can't see how it might apply in the workplace they're not going to derive as much benefit out of it as face-to-face training.

For George, the best way to use the technology in training was 'coupled with face-to-face'.

What the learners told us

The Extractive Industries learner group included only two younger learners, Max and Nick. Since the experiences of the younger and older members of this group were fairly homogenous the whole group's responses are described. The older members of this group were remarkably experienced with ICT.

Max described how he first learned to use computers:

> We get a little manual book, with the thing how it comes, when something comes up you go to the book and sort of read up what's sort of with it, what you've got to do with it, like your scales might be out a tonne, you've got to get back and calibrate your scales and get it back to the right weight.

At the first interview, the group described a dramatic range of ICT experience: Veronica and Phil (early 40s) were into 'the latest technology and gizmos' to keep themselves up-to-date with the kids: Internet, mobiles, DVDs, Video Games, but not chat – that's left for the children'. They bought their first computer while living in New Guinea in the 80s and taught themselves how to use it. And even in the workplace, Veronica continued to teach herself: 'I wasn't even taught how to use our system at work properly … I was supposed to go to Head Office but that never happened'. She felt that there were probably better ways to achieve things than the ways she'd devised. Ten years' ago, they bought a home computer for the kids. Veronica and Phil used email, checked the weather, paid bills, and watched TV and DVDs.

Iris, who was in her late 40s, had used a computer for accounting and word processing in her jobs over the last 15 years and texted and accessed the Internet at home with her children's assistance. Like Veronica, she had taught herself all that she knew as she'd never been in a position 'where training for computers was in the job description'. Iris used email and did her banking online. She also read papers online: Nine MSN and The Age. The option to use predictive text and abbreviations in text messaging was one she didn't take up: 'I still use the written word. I don't know, to me it's like writing a letter'. Nick who watched a lot of television didn't use a computer – he used the Internet for the first time recently to buy something on e-Bay. At the second interview a few weeks later, he admitted to checking his emails for the first time and continuing to play with e-Bay. As he was disappointed with the quality of the product he'd bought, he learned how to use email so that he could contact the vendor. He texted regularly with his mobile and felt at ease with the emergent language of messaging. By contrast, his partner 'is very good on it'; he was, however, moving towards 'having a go'.

Graham, who was 65, didn't use computers: 'It's a modern day thing, isn't it, and … old habits die hard. I guess that is where I'm sitting at this particular point in my life. I enjoy my work very much; computers are part of it, but I'm not pushing the buttons'. When Nick talked about e-Bay, Graham was interested in the possibility of visiting the site. He also liked the idea of email as a communication medium, but stressed that he was an 'outdoors person' and 'been like that' all his life. Initially Graham said that he lacked the confidence to even try, however, after the second interview a week later, said that his interest had been provoked by the questions and discussion about computers and that he was going to give it a go. His son, Max, texted regularly, but admitted: 'I'm not that quick with it so I just sort of punch in very slowly; the person at the other end would be nearly asleep by the time it comes in'.

They all agreed that computers were socially and educationally important, but perhaps at some loss. Veronica acknowledged their educational importance but feared that the library would be rendered obsolete and it could be 'very solitary working on a computer'. Both Phil and Veronica believed that young people were reading less, playing outdoors less and learning how to cut and paste rather than do research. Yet they all believed that young people should be exposed to 'as much technology as they can'. Max pointed out that he found it hard, as it would be for anyone 'who doesn't know what it is'. But Nick also said there were some dangers about the ways in which computers could be used in education. In his VET program, 'the teachers were getting out of work … because they would just give us a website to look up and you'd have to go through all those websites to get the information'. For Nick: 'That's not teaching'. His idea of teaching was of someone 'standing up the front who's got more knowledge than me instead of them just looking up this website and learn about making a bench in a quarry, they should actually teach you how to do it'. Although they expressed interest in the possibility of acquiring new skills for new job possibilities by undertaking a course online, they all valued the physical presence of the teacher. As Iris explained, the little stories that George, the trainer, was able to weave into his presentation were useful.

They accepted the changes associated with the advent of each new technology: 'You might have thought about it when computers were first introduced – like ATMs – you know, like, What's the world turning into? What happened to the Bank Teller?' As Iris concluded: 'We were very quick to accept technology, I think'.

They all acknowledged the importance of different technologies in the workplace. Max used computers to manage the weighing scales: 'You've got pin numbers and punching in numbers'. But Iris rued the paucity of training opportunities in the workplace: 'I find it a little frustrating at times because there could be or should be more training out there'. All liked the PowerPoint presentation George the trainer used. As Nick explained: 'It's a lot more professional. Everyone uses it nowadays. You don't have a big clumsy overhead projector sitting there and you can set your presentation up so that the pages can come and go'. Indeed, Iris said that it was expected: 'That's the way things are done these days'. Graham, seeing PowerPoint for the first time, was 'impressed' with the display: 'It's a hell of a lot clearer than it would have been in times gone by'.

Case 4: Indigenous Learning Centre

The case-study site in a nutshell

Site four was an Indigenous Learning Centre located in the outer metropolitan campus of a university. Health and employment are key areas of disadvantage for Indigenous Australians and educational programs such as this one are important Only 36 per cent of Indigenous learners continue their studies to Year 12 compared with 73 per cent of all students (Australian Bureau of Statistics 2002).

The facility was housed in a modern building: the rooms were brightly painted, and there was an Aboriginal flag and posters with Indigenous themes. Christine and Simon were the coordinators and their shared office had two desks with computers on them that students often used.

The Pathways Program was community-driven with each community deciding how it would use the whole program or aspects of it. The four identified areas were: Conservation and Land Management, Hospitality, Automotive and Art and Design. The program was being used in TAFE institutions but can also used by other Registered Training Organisations (RTO). The aim was that the learners would be fired by interest in a particular area and that the literacy teaching would relate directly to the particular context.

The educator participants

The two educators interviewed were Christine and Simon. Christine was a secondary teacher who moved into private consulting with government departments and Indigenous people. She had always worked in the area of Indigenous education. Even when she was a teacher, she promoted aboriginal education. She was employed by ANTA to set up the infrastructure for the Learning Pathways for Australian Aboriginals and Torres Strait Islanders, which represented an integrated approach to applied learning. There were five core competency areas about which Indigenous communities around Victoria were consulted and Christine was part of the team that did the work. The competencies included Cultural Studies, a community project and communication skills, which were taught as communication, numeracy and IT skills, within an individual pathway plan. Christine and the other educators were very comfortable with the five competencies that underpinned the program. As Christine explained: 'If you leave even one of those out, you're in trouble'.

The learner participants

The two student groups met separately in one of the classrooms. There were three older students, Mark, Pam and Jason. Mark worked in the motor trade for 30 years, had a breakdown, and then took a TAFE course in Art. He worked with the Indigenous Health Service and then went back to TAFE where he completed Certificates 3 and 4 and was now doing a Diploma in Visual Arts. He described himself as 'TAFEed out'. He also painted and sculpted. Pam worked as a nurse for over 30 years. After a back injury, she was eventually 'retired' and was now doing the third year of a Diploma of Visual Arts. Jason worked as a labourer for more than 10 years. He did a four-year

apprenticeship in carpentry but never passed the theory part. He played in a heavy metal band, drove taxis, and was an assistant teacher at TAFE. He was now doing a Diploma in Visual Arts. The three younger students were 15 year-old boys all of whom had started using computers in grade 3.

What the educators told us

Christine deliberately used the term 'communication' rather than 'literacy': 'Communication is about being able to talk, listen, express yourself in writing and to use a computer'. She explained that both older and younger students had had 'very negative experiences through school and often associated the word 'literacy' with things like English or a lot of reading and writing. What we try to do is not ignore these things because they are important'. In other words, the teachers, who worked as a team, focused on literacy without really using the word. The literacy elements of each pathway were embedded: 'We do it in a seamless way in the classes'.

An automotive class that 'died within weeks because they were put onto textbooks by the teacher' exemplified why this approach had been adopted. Christine said:

> It really pulled us up sharp and made us realise we can't ignore this part of what happens in the program. You can't leave Auto or Conservation and Land teachers out there on their own without understanding the fundamental responsibility you have is actually to the literacy area because the mastery of the technical area can't happen and the pathway can't continue whether it's to work or employment without mastering that literacy and basic numeracy in these days of information technology.

However, literacy teaching was not only 'by stealth'; one-on-one intensive tuition was also practised:

> One person wants to read and write and doesn't want to be embarrassed sitting in a room with other people, wants to be able to copy down from the board what a teacher is putting up … because once you've mastered those things you can move down your path. Your choices are much broader, which is what one fellow was saying when he said that he's got no options because he can't record and write down stuff.

She emphasised the need to be sensitive to poor literacy skills because of the deep embarrassment of the students: 'The English language is very tricky – things like silent 'e's. How would you possibly know if you're new to the rules? Spelling seems to be the issue that people get embarrassed about'. In her own teaching of spelling, she modelled for the students how she made choices about letters to use.

The program also had literacy access support staff going to the technical classes to work with students. They were doing a range of things, but the one-to-one was regarded as particularly effective: 'It's a flexible discrete option for some of the young ones who have been traumatised in their early years of attempting to read and write and spell and there's an extreme degree of stigma'.

At this stage, no one in the program was actually integrating the use of computers for the development of literacy skills. The students had access to the two computer rooms in the building and there was a lot of informal learning as 'the young people are brilliant at all of those things and learn very quickly'. However, except for the two computers in her office, they didn't have their own facilities. Christine saw the computers as indispensable: 'They love computers and I'm positive we won't have any problem at all getting literacy-based tasks happening and learning more about computers and those basic skills'. She believed that 'anything with a computer can benefit'. Moreover, 'they need to use it. They can't escape it, in any workplace … and not just a computer … technology is used in so many other ways … the greater the confidence with the computer, the better'. In her public service work, she saw Indigenous people getting close to retirement age 'feeling like lepers because they can't use computers'. She was 'stunned about how much the students can do' but would like them to be using computers more. Like Simon, she believed that

Indigenous students respond to the visual: to pictures, stories, role-play that computers can easily incorporate.

Christine, went to the TAFE management arguing that they couldn't run the program as there was a computer access issue: 'Most of the students wouldn't have computers at home and so we do really need to provide access'. However, they had been waiting for the computers to arrive for two terms. And, as is so often the case, the six computers they were waiting for 'are really just old computers that are being moved over here'. If someone offered a gift of money, Christine would have used it to buy a bank of new computers and software designed to enhance literacy skills. She valued the drill and repetition that the computer would facilitate, and she also saw it as fun for the students – an effective way to learn.

Like all the educators interviewed, she regarded mobile phones as important: 'Even though they're strapped, most of the students seem to have a mobile phone. They're very committed to the mobile phone and a hell of a lot of communication goes on that way – mainly texting'. She saw potential in bringing the phones into class and that the students could compile a dictionary: 'it's communication, it's writing and even though the spelling may be unconventional, they can use it. They also use the Net a lot'.

Until the six computers arrive, Simon and Christine planned to continue to let the students use the two computers in their office: 'We don't like to discourage them, particularly where there are literacy issues. It does really seem to help in that way ... It's a terrific tool ... It can be very meaningful'. When they are using chat, 'they're communicating using text'. She explained that even when the students said that they couldn't read or had grade 3 writing, they used unconventional spelling and got by.

Christine observed striking gender differences: 'The boys have an extreme resistance to reading and writing, unless it's on the computer … and unless it's an applied learning situation'. By contrast, she noted less resistance among the females: 'They do most of the reading and writing tasks that emerge from the community project even though they have the same lack of confidence that the boys have'. The boys were also often unwilling to show their lack of skills in front of others:

> So they pretend that they can spell – I could do that if I wanted to but I don't want to – I could do it but I don't want to – that's why I'm not doing it. We know that nine times out of ten, the reason for the resistance is that actually they can't do it at that moment. It's that sort of thing and it's mainly the boys.

Christine would have liked to have had better computer skills herself even though she could word process, use PowerPoint and email. In particular, she would have liked to learn how to use Excel. After keeping a technology-use diary for a week, Christine was surprised at how much time she spent on the computer at night – mainly for 'communication, sort of tidying up, making sure that people have what they need'. She also prepared tenders – often using a prescribed template. And another facet of her home computer use was responding to invitations for student participation in programs offered by other organisations.

Christine had clear views about the best approach to literacy and technology education: an integrated curriculum and, wherever possible, one-to-one teaching. Unlike many TAFE programs that were driven by the pursuit of separate competency outcomes, the Indigenous Pathways Program had an integrated approach. However, there were many at-risk people, 'coming back for a second chance to do automotive because they wanted to do something hands-on', who, when they 'find themselves stuck in a pile of textbooks', were 'put off'. There was still a need, therefore, for attention to be directed to the students' literacy and numeracy needs. This highlighted the issue that across the disciplines teachers 'need to be acutely aware of what the literacy, numeracy and IT implications are'.

For Christine, the ideal was an integrated program that built in reading, writing, numeracy and IT capabilities:

> It seems pretty logical to me that any teacher working with access groups who are coming back for a second chance can expect some difficulties with reading and writing. So then why aren't all of those teachers involved in supporting that second chance? Are they acutely aware of what the language and literacy implications are with what they do, the choices they make and how they set up tasks for all those sorts of things: the numeracy, the culture, the IT?

Her solution was:

> When the students are in the auto shop, they are working with a literacy person and an IT person so that the team will be basics people and they will all receive literacy development and there will be a cultural person there too. So the vocational teachers, and some won't like this, is that they are a language teacher whether they like it or not.

However, Christine was aware that this was not easy to achieve:

> In the TAFE sector we rely on sessional teachers who are not paid for professional development often, so they come from industry and know their trade well but have not considered the implications of what they're doing – they have a fear of them. [In the TAFE system] there are too many things blocking working in teams and developing applied learners.

When the teachers were attempting to integrate technology into the Pathways program, Christine would have liked 'to see them excited about using it, not feeling like it's a burden, like the computer is a big millstone to carry on your back … And they see the computer as a tool which is sad ... It needs to be seen as both a literacy tool and as a form of communication'.

Rather than dedicated courses to teach computer skills, her solution was one-to-one opportunities: 'developing a relationship with someone and showing them how to use the tool in relation to what they need to do and fuel those things to the point that it works'. She offered the example of two younger workers showing two older workers how to use a technology: 'There was no big fuss. The culture of the place was good to allow this and that is exactly what we do here'.

Christine recently recruited Simon to the Pathways Program. He came from Centre Link where he was the Indigenous Services Officer and before that, he worked with youth as well as people wanting to learn about Indigenous culture. He was born in regional Victoria, a location where there has been a strong emphasis on the importance of education. This made the process of him continuing a lot easier 'as the path had been laid by the previous generation'. When he left school, he began an apprenticeship, but then worked as a cultural officer and educator, liaising between communities and teachers.

His first encounter with computers was in a TAFE course in the early 1980s in a group with mainly older Indigenous people. He became the expert in that group, but they also all learned from each other. He stressed the importance of a support base in helping the group develop skills, but it also had to be a lot of fun. Simon continued to use computers with students: the visual and opportunities for play 'kept them interested'. He had sophisticated computer skills.

Simon ran various computer programs with the local community:

> Some of the elders wouldn't touch it, wouldn't go near it. It was a new technology that they knew nothing about … They found it very hard to take their eyes off the screen and write something because they were thinking in TV mode, that you actually watched it, and we had others who didn't even want to turn it on. There was that fear … But after a month, just to see the difference in them. They would walk in and without even thinking turn it on. It was interesting how in terms of the knowledge they get from the computer course. It really pushes them along easily.

His role in the Learning Pathways Program, a flexible curriculum designed specifically for Aboriginal and Torres Strait Islander people, concentrated on pastoral care:

> If it's not right at home, it's not right in the classroom. If there's an issue with housing, domestic violence, alcohol or drugs and Johnny rings up to say that he can't come to class

> because he has to look after the kids as Mum and Dad have had this fight, then I have to look around. In one situation, I was able to support the family, getting the aunty involved, helping out the mum, so Johnny was fine – not worried about his mum … we look at things holistically. We care what's happening at home.

Simon didn't teach. He was at the back of the room making sure that everything was okay. From the beginning, he told the students that if they were not serious and didn't want to take the next step, then, 'There's the door. Get out'. This approach derived from his own experience: 'All the TAFE courses that were shoved at the Indigenous students – they never really got me anywhere'. He worked in factories, at one stage trained for Collingwood football team, but didn't like being in the city away from home, so he returned to his town.

In the Indigenous communities, phones seemed to be the most popular technology. In the 1980s, Simon remembered that no one had computers and when the very young kids saw them in service offices 'their eyes popped out of their heads'. But even in the 80s, people were beginning to borrow computers from TAFE colleges. Simon regarded being able to use a computer as socially necessary. He observed that students 'who have literacy and numeracy problems know a lot about computers and how to surf the net and that sort of thing'. He was amazed at students who couldn't read and write, yet texted with their phones:

> It astounded me how "well, I can't read" is a convenience thing, it's a mindset. "I can't write that down but I can type it, I can text it" ... It's amazing when it comes to technology, they pick it up as quick as that and it becomes infectious among the group, and then all of a sudden: "How did you do that?" Bang bang. "Oh yep, no worries. OK. I've got to write it all down." … It's strange how people learn. People have different learning styles. One size doesn't fit all'.

Like Christine, Simon believed that aboriginal people are visual in their literacy:

> You see them watching movies, watching video. We as a people are visual. In Corroboree, dancing is our script. In a Kangaroo dance if you say to non-Indigenous kids what they learned – well I jumped around and I ate some grass. Say it to an Indigenous kid and they'd say: Well I did this and I did that, I know that the best time to hunt kangaroo is in the middle of the day and I know his eating habits and what he eats and where the food is which helps me in my survival so I can go out and hunt. It's a visual thing. I was always told to pay attention to detail. You look at something, you look at the holistic art. I remember that, remember that other tree was on the left, yeah that had a scratch on it, yeah, so it's all visual stuff that was in line with our cultural line.

He commented: 'We spent millions and millions of dollars on literacy. Someone is always coming up to teach people to read and to write. If they could concentrate more on the visual they might have more success. I'm giving people the technology to do that sort of stuff. I'm a firm believer that the easiest way to learn is visual'.

For Simon, technology was central: 'The way youth are today, no matter what colour, it's that networking stuff, how they do in terms of technology and how to use things and if you can harness that somewhere, channel it into efforts of employment or just in what they do in everyday life'. Moreover, he observed that the students were extraordinarily capable with the computers: 'Kids with no confidence, in front of the computer, they knew a lot more than I did. They used the language of the Internet – backslash, underscore, download etc.' He was also aware of how much he used technology in his own life. Just checking email took a lot of time and also doing bits and pieces for the program which was mainly keeping tabs on the students. He'd just started communicating with some students at Box Hill TAFE via email.

In Simon's view, the best way to integrate technology was to identify the students' interests and incorporate technology according to them. He began with some fun stuff and a laugh and then the serious stuff and then ended with fun. He emphasised the value of using sport and music as contexts in which the Indigenous students can achieve. They provided motivation. He gave the

example of a student in the program who read Vibes magazine, an Indigenous national magazine: 'The young man could tell you all the details available in the magazine, yet in the classroom he can't read'.

As all the educators interviewed, Simon advocated 'literacy through subterfuge'. He described how Christine gave the students a task and soon they were doing something without realising that they were: 'I feel that that's about the only way you can teach these kids. Sneak it in there and we do it And they walk away really proud about it'.

What the younger learners told us

All three younger learners had computers at home, but Pete's was broken and hadn't been fixed. Jason played multi-user games on the Internet. He also went to Player cafes but really couldn't see the point as he could 'meet' other people online. All three had broadband connections at home. Jason's father also played games, but they didn't do that together. Jason liked the mobility and freedom of a laptop. None of them believed that computer skills for the workforce applied to them: Hospitality and Conservation and Land Management. There were not many opportunities to use computers in these two courses. They commented: 'Computers can't cook', 'computers can't think', 'computers can't write for you': if given a choice between a cell phone and a computer, all three would have chosen a phone.

What the older learners told us

Mark claimed technological ignorance, but if his evidence was that he couldn't program a video recorder, then the majority of the population would have to be described as technologically deficient. Technology was part of his job in the motor trade and he also took a couple of computer courses at TAFE in the 1980s. He couldn't 'fathom how they worked' and didn't pass. But when he started a Tourism course, he had to learn how to word process which he managed. Although he complained about losing documents, he used the Internet successfully 'to chase down research'.

Pam used computers in the 80s 'when they were green' – the Apple 11e computers. She typed up patients' reports: 'I actually love computers, love technology – that's the reason I don't have a computer at home because I would never be off it'. Pam had to learn how to use a computer herself on the job as a nurse: 'They were shifting me from department to department just to set up their computers'. As a nurse, she used Excel to prepare rosters. She had a mobile when her father was alive and she had to travel long distances to visit him, but now that he was dead, she no longer had one as 'it's too expensive'. Both Mark and Pam had two more years to go in the Diploma Art and Design program. Mark said that he wanted to be a Doctor of Indigenous Art. Pam, somewhat dubious about Mark's ambition, wanted to be an Art teacher.

Jason had a computer at home but was not connected to the Internet. He used the Internet at TAFE to visit chat rooms and to play chess: 'I'm here so early because I get bored; this is a good medium for relaxation'. In a Yahoo chat room, he met another Aboriginal person who turned out to be a relative: 'We ended up crying. She had the camera and the sound but I didn't have the camera and microphone, but I could see her'. Friends had told him that he had to get onto the Internet and to get email, and then 'someone showed me and I haven't been the same. I can't go off the damn things now'. Eventually, he got a mobile and he was texting.

All three did a multimedia course at Swinburne TAFE and produced a CD. But Pam said that sometimes the classes were difficult and you could get left behind. Mark believed that it was hard to retain what was taught in a formal class. Jason thought that the use of technology should be 'shoved straight in'. He recalled the first time he saw a PowerPoint presentation displayed on a wall. He thought: 'What's that got to do with anything – it's on the wall'. Pam explained that people of her age weren't interested in too much technology: 'I've got to the stage of my life where … we

want things to be simple'. And about computer literacy: 'Unless I had to have it, unless I needed to have it, I just don't choose to have it, because as I said, I would never be off it'. She acknowledged the importance of computer skills for the younger generation: 'Because in the future that's what it's going to be'.

Mark gauged that the Internet had made Indigenous people a lot more aware of what communities were doing – there's educational information available, particularly about art and about remote communities. However, he also emphasised that the technology had its place: if he was consumed by the computer then he had no time for his four dogs – to sit down and play with them. He explained that the older Indigenous people weren't using the technology but they were talking to the young ones who were creating the websites. Pam thought the technology was good as it 'opens up a whole world that you don't have to spend a lot of money to see'. It also gave access to 'the whole culture – where they live and how they live and what they're doing'.

Their recording of computer activities over the week confirmed that they mainly used ICT at TAFE. Pam borrowed a laptop for a week to write an essay. As no one explained to her how to set it up, she got some assistance from her neighbours. Mark used his home computer for word processing. Neither Mark nor Pam had a printer at home so they used the printer at TAFE. As they didn't have home access to the Internet, they would have liked more access to multimedia facilities at TAFE: both saw advantages in the short course they had done. In particular, they liked the products, the capacity for graphic design and for playing with colour and photographic images. Overall, they believed that there was not enough technology available to the students in the TAFE program. They'd like scanners and printers – as Mark says, 'the peripherals'. Pam saw these things as a must – Mark as 'an enhancement'. Despite the widespread belief that Indigenous programs were well funded, Pam said the problem was that 'it's all token. There is no real follow-up – nothing major is on-going'.

Case 5: Mitchell ACE Community Education Provider

The case-study site in a nutshell

The fifth case study took place in a large regional adult and community education provider located in a regional town. Some 24 years' old and taking in 4,000 enrolments, it was located in an extremely disadvantaged region. The overall unemployment rate was 12.8 per cent (Australian Bureau of Statistics 2004a), while youth unemployment ran at 22.9 per cent, and the community was ageing at a rate above the state average. Unlike many ACE providers, Mitchell ACE was successful in attracting older men into its programs. We conducted our interviews and group interviews at the main Mitchell ACE campus which was situated in an attractive complex of buildings, previously used as a school, close to the centre of town. Overall the ICT resources and support available at Mitchell ACE were inferior to those seen in the large TAFE Institutes.

The educator participants

Four Mitchell Ace teachers agreed to be interviewed. Elena had worked as a sessional teacher at Mitchell ACE for eight years and for the last two years had been a full-time teacher at the centre. The second Mitchell ACE educator, Ray, aged over 60, was a retired secondary teacher who had been teaching at Mitchell ACE for about a year. He was an industrial chemist for ten years and then taught for 22 years. He moved to the town on retirement and had many interests apart from his paid work. ICT, however, did not feature amongst these:

> I don't know why, I just can't seem to muster any interest in computers though. I don't need them. I never have. I've tried using the Internet two or three times and spend hours trying to get the information. In the end I just pick up the phone book..

Anne, aged 46, was the third educator we interviewed at Mitchell ACE. She had worked with the organisation for three years, starting off as a project officer and was now in the role of Language and Literacy Coordinator. Anne coordinated a range of language and literacy programs including the VCAL program with a near-by Secondary College, a PALMS program for disengaged young people, a WELL program with an Indigenous group and an ESL program. Anne first used ICT in the 1980s when she was working in a bank. She was largely self-taught. The fourth Mitchell ACE educator, Gail, was the only teacher under 40 whom we interviewed at Mitchell ACE. Gail was initially a florist who taught floristry part time at Mitchell ACE. Although she had no teacher training apart from a 'certificate to train' (presumably a Certificate IV in Workplace Assessment and Training), she had become a tutor in language and literacy. She had worked particularly with older unemployed men displaced by the demise of the forestry industry in the region. These workers had 'really low language and literacy level'. She described their poor communication skills:

> They drove trucks or they felled trees … Apart from their pub talk they didn't need to communicate terribly much … but you know, one of them who was married couldn't write his children's names. He had six children and couldn't write their names; couldn't write his street address. He knew where he lived but he couldn't write it.

The learner participants

The group comprised three learners who were over 40 and four who were under 40 years of age. This group did not participate enthusiastically in the conversation. The participants appeared to have relatively little experience of ICT and most of that had been obtained at Mitchell ACE.

What the educators told us

Like many of our study participants, Elena first used a computer when her six-year-old daughter was able to take a school computer home for the weekend:

> Our first computer we probably got when my daughter was in about grade 2 and we've updated a couple of times since then. Now she's got her own computer down at university in the city so I often have to call her and ask her what's gone wrong with our computer and she'll give me some advice and information over the phone.

She was a capable user of ICT in her personal life and used them for Internet banking, online shopping etc. Elena used computers with her adult literacy students, encouraging them to type their stories and other documents. She appeared to be the most enthusiastic user of ICT in the classroom at Mitchell ACE and was certainly the only teacher we met there who used a computer for more than word processing, searching for information on the Internet or email.

Mitchell ACE was poorly resourced with ICT equipment and Elena had a long wish list including well-maintained computers, Internet access in classrooms, a networked printer, a data projector in her classroom, a new photocopier that prints double-sided. Mitchell ACE students often come into the teachers' office to access the Internet and this proved to be problematic for staff:

> To use the Internet they have to come over into our office and that's a real privacy issue. Sometimes we're interviewing other students or talking on the phone to different people and forget that they're sitting there using the Internet.

Mitchell ACE was similar to other ACE providers in managing on a shoestring. As a consequence, the centre had only recently obtained technical support for its IT equipment for the first time and had little budget for professional development of its staff. Nevertheless, Elena had attended classes in MS Publisher and MS PowerPoint. She had sought online learning resources from the TAFE VC and TAFE Frontiers and had used *Writers' Caravan* with her classes.

As a schoolteacher, Ray directed students to use computer-based learning resources, although he never used these himself: 'I never used them personally, I directed the kids to them. I just found out I never needed to … just what they call a Luddite'. Despite Ray's claim that he did not need computers, he confessed that his wife used a computer on his behalf for family business and that his son, a computer instructor, 'puts these programs on the computer for me like *golf* and stuff'. He also had the usual mobile 'just for emergencies'.

Ray perceived Mitchell ACE to be an organisation that was enthusiastic about the use of computers in learning but 'suffering from using outdated equipment'. Apart from the lack of power in the machines, the wiring in the building was out of date and rooms could lose power. This problem would be resolved soon when the building was given to Mitchell ACE permanently and the organisation could plan to have it rewired. Like the other teachers, Ray regarded the office as 'pretty well set up computer wise', but to an observer, it was not. There was no email system for staff and limited use of administrative software generally. There was no ICT plan for learning or infrastructure.

Anne, like Bill and Elena, identified the problems Mitchell ACE faced with acquiring, maintaining and upgrading equipment: 'It's a huge frustration. All the equipment we use is substandard and the worst part is nothing is standardised. We get all the leftovers. It is tricky for beginners'.

Anne also drew attention to the lack of staff development funding to support ICT use in learning at Mitchell ACE. The organisation had only a small professional development budget and prioritised professional development for literacy teaching and working with youth and learners with psychiatric disabilities. The Mitchell ACE manager, who spoke to us at afternoon tea, reiterated many of Anne's points. Mitchell ACE had trouble keeping good staff because they could not pay as well as the local TAFE Institute.

Gail appeared to have the most negative attitudes to ICT of all our Mitchell ACE informants: 'I hate computers which is probably what you don't need to know'. Gail explained her 'hatred' of computers as a result of being 'more artistic'. She was able to word process, use email and search for information on the Internet. She said that both she and her husband got frustrated with the computer because 'when it works, it's wonderful and when it doesn't I get the shits and, and I get too frustrated with it'. She suggested jokingly that Mitchell ACE probably employed her because she was 'cheap' and did not 'do any of that stuff', such as PowerPoint.

Gail certainly did not encourage her learners to use ICT. She did not consider that she needed ICT skills in her life and so didn't see these as necessary for her learners:

> They did have days where they went on the computer and out of the five of them probably one of them was successful because of the low reading and writing skills. It was really hard work. The guy who we got training that was a real ocker sort of a bloke. We got someone in who was basically at their level in that sort of language and he got on really well with them. He did get some results but it wasn't terribly successful. I did stuff like we were looking at instructions on how to use a photocopier, using the instruction manual compared to having no instructions. Just looking at it I did those sort of stuff with them with a photocopier, with a digital camera, with a video camera, with a binder, a book binder, and that seemed to work better because they could actually, well they needed to talk to each other to figure out how to do it because they didn't have the instruction manual and a lot of them, because they're that sort of, because they were *sort* of hands on learners, they found it easier because they didn't have the instruction manual, but no I didn't do any computerised stuff with them, but they were trained in that.

Gail openly expressed her disdain for computers and they were apparently not used in her classes:

> I prefer it if they actually used their imagination and did it on paper, fairly old fashioned I suppose, but I find that it works and a lot of my kids are artistic and they'll scribble all day over their books. I'm teaching every Wednesday and I've got four computers in the room and I reckon out of the nine students, I've got not one of them has asked in the last four weeks if they can turn the computer on, but they're quite happy to fill out their workbooks and as I said, they don't ask to play them at lunchtime.

What the learners told us

The interview group had had relatively little ICT experience and much of it had happened at Mitchell ACE. They did not participate enthusiastically in the focus group. Andy had a mobile but 'only turns it on when the car breaks down'. Andy was the most enthusiastic advocate for the Internet and had been enjoying his first steps to find help with maintaining his Harley Davidson. Sharon was in the literacy class because her employer identified her low literacy skills and asked her to seek help. She had very little experience with ICT and did not even use an ATM: 'Well my husband does. He's got my card'. She and her ten-year-old son played computer games.

The group generally reported little access to computers at home and little experience with them. They saw computers as frustrating and difficult, as they indeed were at Mitchell ACE. Craig was an exception. He had for a time found employment managing a pornographic website:

> It only lasted two months because once every month the search engines do an update and when you type in a keyword it might have ten to twenty thousand sites with that keyword.

> There's a reason as to why it brings up the top twenty ranging and you get ranged once a month and I was in the top twenty for two months.

In response to questions about any issues that affected their ICT learning at Mitchell ACE, they all nominated 'old files and slow programs' as a problem. They also explained that there was only limited Internet access. Most participants expressed interest in having computers and Internet access at home but gave us the impression that the ICT world was not real to them, as Ronny explained: 'See I would be satisfied if I could get the Internet for three months, right, and then just see everything I want and not worry about it for another couple of year'.

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