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Uncertainty and certainty: the visions and roadmaps of ICT educational policy

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*For I dipt into the future, far as human
eye could see
Saw the Vision of the world, and all the
wonder that would be.*

Alfred Lord Tennyson, Lockesley Hall,
1842

We cannot know the future. When we try to imagine it and its wonders, we invariably think of technology, particularly information and communication technology (ICT), basing this on what we see in the present and expect to continue. Koffi Annan, Secretary-General of the United Nations, offered that:

The swift emergence of a global information society is changing the way people live, learn, work and relate. An explosion in the free flow of information and ideas has brought knowledge and its myriad applications to many millions of people, creating new choices and opportunities in some of the most vital realms of human endeavour. (Annan, 2003, para. 1)

But future wonder is underscored with uncertainty. The rapidity of technological change, our consciousness of it and, as identified by Lem (1990), our apparent inability to restrain or contain its acceleration bring us anxiety. UNICEF's *Global Agenda for Children: Learning for the Twenty-first Century* contended that:

In order for the world to survive and prosper in the new century, people will need to learn differently. A child entering the new century will likely face more risk and uncertainties and will need to gain more knowledge and master more skills than any generation before. (UNICEF, cited in Butler, 2005, p.9)

While this conjures up a vision of fear rather than of wonder, it most critically positions education as an essential survival skill. Educational policies, through 'Visions of the world' and strategies, attempt to balance wonder and fear and bring certainty to uncertainty. This article

will consider the role of ICT in education in Australia and New Zealand as seen through its past and present policies. In speaking of the future in terms of the past, it will revisit a prediction for the future made in 1999 and determine the endurance of its contentions.

Policies, particularly relating to ICT, invariably begin with a statement about technological change creating a sense of uncertainty and casting the policy into the role of heroic protagonist. In the 2004 New Zealand *Digital Strategy*, the Associate Minister for Information Technology and Communication, David Cunliffe, offered that 'we live in a time of rapid and unparalleled technological change' (Ministry of Economic Development, 2004, para. 1). Similarly, the Queensland *Smart State Strategy* began by stating that 'the world is changing rapidly: our work and daily life require skills not even imagined just a few decades ago. This rate of change is likely to continue in coming decades' (State of Queensland, 2005, para. 1). The tenor of the documents is set.

The vision of the future that these policymakers have 'dip into' is acknowledged to be one of uncertainty. To write policies in this tenuous environment is to attempt, in an optimistic and anti-fatalistic way, to impose certainty onto uncertainty. Moyle (2005) explained that:

... policies provide a window into the aspirations of the authors, since policies are created in order to articulate preferred visions of the future and are used to make decisions in the present that are consistent with these visions. (p. 3)

The imagined Vision or preferred future then becomes the metanarrative

or seamless myth for which all policy is written and enacted. The vision and the policy are reflexive and interdependent like the statements in a circular argument.

Policy has a theoretical and logistical duality. The Australian national action plan for the Australia-New Zealand *Learning in an Online World* policies set out both 'a vision for the future and a roadmap for change' (Education Network Australia (EdNA), 2000, p. 1). The 'vision' – like Tennyson's in *Locksley Hall* and alluded to by Moyle (2005) – is the belief upon which practice is built. It is belief rather than fact because of its tenuous and speculative nature. The 'roadmap for change' is the operational application of the stated policy. But the words seem curiously juxtaposed. A road is a major public undertaking and financial investment, the product of proactive multi-agency planning requiring an interconnectedness of engineering and demographics. A map of a road is a symbolic representation of the road and its underpinning technology. It is certainty itself – drawn to scale, described in a familiar and understood visual language and trusted to lead you to a predetermined outcome. To say that something is a 'roadmap for change' is an oxymoron asking us to accept the paradox that uncertainty can be mapped and described in familiar or understood ways. In essence, uncertainty is being made certain.

The discussion in this article will continue in two sections. The first is concerned with visions of the future, specifically of (a) education, and (b) future citizens. The second section will consider policy 'roadmaps' – the paths to the future – with specific attention given to the role of ICT in enhancing learning.

Visions

A vision is here defined as a prediction for the future. It is necessarily founded in our experience of the present and informed, if we choose to listen, by the voices of the past.

A vision of education

The right of every individual to education is inalienable. It is seen as 'a basic human right, vital to personal and societal development and well being'

(UNICEF, n.d., para. 1). It 'enhances lives. It ends generational cycles of poverty and disease and provides the means for sustainable development' (UNICEF, n.d., para 2). However, in recent policy documents from Australia and New Zealand, a focus other than this fundamental humanism seems to be emerging.

Australia's *Adelaide Declaration*, the National Goals for Schooling in the Twenty-First Century, offered that 'Australia's future depends upon each citizen having the necessary knowledge, understanding, skills and values for a productive and rewarding life in an educated, just and open society' (MCEETYA, 1999, para 1).

The *New Zealand Curriculum (Draft)* offered the vision that:

Education has a vital role to play in helping our young people to reach their individual potential and develop the competencies they will need for further study, work and lifelong learning. It is by developing these competencies that they are equipped to participate fully in New Zealand society and contribute to the growth of its economy. Education is the key to sustaining our nation's development and to its successful transformation into a knowledge-based society. Education empowers our young people to stand tall as New Zealanders, seize opportunities, overcome obstacles, and make a difference. (Ministry of Education, 2006a, p.8)

The vision is one of future national development and economic growth within what has alternately been called the information age, innovative or knowledge-building societies, or information economy. These statements beckon to the future and share the core theme of national transformation through education. Projection to the future and imprecise expansive descriptors protect the policies from accountability. In each instance, we are expected to accept that there is no past or present – only plans for the future.

The statements also share the lexical device of transitivity where action is ascribed to inanimate entities. This gives the policy's authors the benefit of 'plausible deniability' (a term devised

during the Nixon presidency) and a pre-emptive scapegoating in case of failure to deliver. An example of this can be seen in *The 21st Century Learner: An e-Learning Action Plan for Schools 2006–2010* where the New Zealand Minister of Education concluded that:

We stand at the start of a new century, seeking to transform our nation. The power of education to drive that change is as potent as ever. But we can only exercise that power if education itself is transformed, and this e-Learning action plan will make a substantial contribution to that transformation. (Ministry of Education, 2006b, p. 3)

The 'we' is either the current government or the people of New Zealand. The clear and persistent national goal of transformation is reiterated with the added breathless pregnant promise of 'stand[ing] at the start of a new century.' The undoing of this noble venture will be if the personified 'education' is not transformed. The villain of the melodrama is identified. A parallel example is seen in the initial release of Education Queensland's *ICTs for Learning Strategy*. The then Director General of Education offered that:

ICTs are at the core of teaching and learning in the 21st Century. Queensland's future depends on how successfully we integrate ICTs in the curriculum and daily learning and teaching. ... Many teachers already use computers to enliven teaching and inspire students. In order to build a 21st Century schooling system ..., we need teachers to understand how ICTs promote higher order thinking skills and deepen understanding in all key learning areas. (State of Queensland, 2002, para. 5)

Here the entire future of an Australian state (Queensland) is said to depend 'on how successfully we integrate ICTs in the curriculum and daily learning and teaching' and intimates that 21st Century schooling is one (as with New Zealand's e-Learning) which will be founded in ICT. The villains here are teachers rather than the personified 'education.' It is they and not the forces of global markets, climate extremes or other causal events which

stand to impact on the economic and social future of the state.

Both the New Zealand Minister of Education and the former Queensland Director General of Education acknowledge that the future is uncertain but, despite this, remain steadfastly certain that e-Learning and 'ICTs in the curriculum' are the right 'roadmaps' to the preferred future of national transformation. This certainty allows both political distancing and the outward appearance of action. It also cleverly allows a pre-packaged scapegoat. National economies will indisputably and exclusively rise and fall on what happens in every classroom in the country and when and how ICT is used!

In 1995, Chris Bigum suggested that, despite the rhetoric, only two basic claims were made on behalf of computers in education. The first of these was that the use of ICT in schools would prepare students for future employment. The discussion in this section, of the published visions of education authorities in Australia and New Zealand, would suggest that this claim remains true but has escalated from personal to national economic benefit – morphing into a broader national economic agenda. The second claim identified by Bigum (1995), relating to enhanced learning, is considered in the later 'roadmaps' section of this article. It, too, interestingly, remains true but has evolved into a new more encompassing form.

A vision of future citizens

The myths of technology, and that of ICT in particular, are embodied in the definition that 'technology is the magic of the modern world and every man, woman and child, however humble their circumstance, can be a practitioner of its art' (Romanyshyn, 1990, p. 2). It is of interest to consider briefly how governments and educational authorities perceive the role of ICT in our uncertain future. President Clinton, in the 1997 State of the Union address, said that 'the benefits of the technology revolution ... [are] the modern birthright of every citizen' (Clinton, 1997, para. 64). In New Zealand in 2004, a similar sentiment was offered:

Our government is committed to bringing the benefits of ...[ICT] to all New Zealanders - to create a society where ICT empowers everyone to create, access, utilise and share information and knowledge, enabling individuals and communities to achieve their full potential. (Ministry of Economic Development, 2004, para. 2)

These notions of equity and empowerment are palpably present in the goals of contemporary educational policies. The New Zealand *Digital Horizons* policy (Ministry of Education, 2003) declared that 'all learners will use ICT confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community' (p. 3). Using similar phrases and espousing a comparable view, one of the Australian National Goals for Schooling (Goal 1.6) states that learners will 'be confident, creative and productive users of new technologies, including information and communication technologies, and understand the impact of those technologies on society' (MCEETYA, 1999).

The notion of our students as practitioners of the magic is heightened by commentators who promote and sustain notions of preternaturally and intuitively technologically-literate children. They are given catchily-named but ill-defined labels such as Nintendo-Generation, Generation (Gen) X and Generation (Gen) Y. The Millennials (born since 1982) are said to be 'tech savvy and have lifestyles that revolve around digital connectivity and the Information Age' (Butler, 2005, p. 6). Generational definitions are equated with an individual's digital literacy with Oblinger and Oblinger (2005) arguing that, for Net Gen (similarly born since 1982), 'the Internet is like oxygen; they can't imagine living without it' (para. 32). The analogy to oxygen and the related understanding of being necessary for life itself is sustained by John Seely Brown, the former Director of Xerox Palo Alto Research Centre, who offered that:

Today's digital kids think of information and communications technology (ICT) as something akin to

oxygen: they expect it, it's what they breathe, and it's how they live. They use ICT to meet, play, date and learn. It's an integral part of their social life; it's how they acknowledge each other and form their personal identities. (Seely Brown, cited in Butler, 2005, p. 8)

In the letter which accompanied the draft copies of the 2006 New Zealand Curriculum, the Minister for Education, Steve Maharey offered that 'students today are different from those of yesterday. They think and engage differently.' This would suggest that the uncontested assumption of student technological literacy is part of the understanding of policymakers and impacts on their vision of the future. It is timely here to add the postscript to Koffi Anan's previously cited comments about the global information society. He tempered his comments with the observation that:

Yet, too many of the world's people remain untouched by this revolution. A digital divide threatens to exacerbate the already wide gaps between rich and poor, within and among countries. The stakes are high indeed. Timely access to news and information can promote trade, education, employment, health and wealth. One of the hallmarks of the information society – openness – is a crucial ingredient of democracy and good governance. Information and knowledge are also at the heart of efforts to strengthen tolerance, mutual understanding and respect for diversity. (Annan, 2003, para. 2)

Roadmaps

A roadmap is here a strategy or plan written with the intent of enacting a published policy and achieving broader systemic goals. Following this analogy, the road, separate from its symbolic representation as a map, can here be said to be the backgrounded technology and learning environments which make use of ICT. In the ICT 'roadmap' for education in Queensland, the 2004 *ICTs for Learning Strategy*, the Director-General of Education and the Arts said that:

... the strategy was born of a resolve to prepare Queensland's state school students with the skills they need for the information age. The strategy aims to help students readily access a foundation level of ICTs at their schools. It is about every school having a foundation level of ICT infrastructure and connectivity, and every teacher having a foundation level of ICT skills and an insight into ICT curriculum integration. Once these foundation levels are established in every state school, students and teachers can take full advantage of the incredible, exciting opportunities that using ICTs creates. (State of Queensland, 2004, p. 6)

This roadmap describes a 'road' with three components – infrastructure/ connectivity, teacher skill and 'insight' into curriculum integration – which, consonant with the embedded vision, are intended to create the environment for 'incredible, exciting opportunities.' This is consonant with the statement prefacing the *Contemporary Learning* document (part of the MCEETYA Australia-New Zealand policy *Learning in an Online World*) which offers that '21st century education integrates technologies, engaging students in ways not previously possible, creating new learning and teaching possibilities, enhancing achievement and extending interactions with local and global communities' (MCEETYA, 2005, p. 2).

Together, these maps and visions illustrate the claim of 'enhanced learning,' the second of the two basic claims which Bigum (1995) had noted were made on behalf of computers in schools. Current policy sustains this vision but, as with the escalation of employment into broader economic agendas, the notion of 'enhanced learning' has broadened into claims for a holistic pedagogical approach, a primer for 21st-Century education.

The draft *New Zealand Curriculum* document included e-learning under the general heading of 'effective pedagogy.' It is grouped with such positive actions as (a) encouraging reflective thought and action, (b) making connections, (c) providing multiple opportunities to learn, (c) facilitating shared learning, (d) enhancing the relevance of new learning,

and (e) creating a supportive learning environment. The rationale for its inclusion is embedded in the statement that:

Information and communication technology (ICT) has transformed the world in which young people live and e-Learning (that is, learning supported by or facilitated by ICT) has similar potential to transform classrooms. (Ministry of Education, 2006a, p. 25)

Advice is given for schools to 'explore not only how ICT can supplement traditional ways of teaching, but also how it can open up new and different ways of learning' (Ministry of Education (New Zealand), 2006, p. 25). Despite this, the curriculum document does not make direct reference to the contemporaneous *21st Century Learner: An e-Learning Action Plan for Schools 2006–2010*. e-learning is only mentioned in a section heading and within the previously cited definition. The text makes mention of ICT in four separate contexts. These are:

1. In the Foreword (p. 3), written by Howard Fancy, Secretary for Education, ICT is grouped into a global descriptor of changes since the publication of the previous curriculum in 1992. The text lists 'changes in New Zealand society, changes in the economy, and the new opportunities opened up by information and communications technology (ICT), including the Internet' adding that, 'New Zealand is part of the global community and influenced by international events and trends' (p. 3).
2. In the section entitled 'Using language, symbols and texts' (p. 12). It suggests, through a referent pronoun, that students who are competent users of languages and symbols 'use ICT confidently to overcome barriers to communication, access information, and interact with others.' It is important to note that this sentence is in isolation to the key text which describes expected understandings of making meaning, representing and communicating information, and producing a variety of texts.

3. The third reference to ICT in the curriculum document is, as previously noted, within 'e-Learning and Pedagogy' (p. 25). While this text appears of equal weighting and importance to the other listed teaching practices, it differs in nature to these entries. It is also, intriguingly, not included in the advance organiser list offered on the preceding page (p. 24).
4. In the section entitled 'Planning for the Development of the Key Competencies,' ICT is described as giving 'students access to a vast range of information and real-life contexts that have meaning for them and that can be used as a basis for learning experiences. Schools need to consider how they can use the opportunities offered by ICT as [the] means for developing their students' competencies.' (p. 29). The Key Competencies are generic attributes, namely, managing self, relating to others, participating and contributing, and thinking. The reference to ICT in achieving these competencies is not elaborated and sits as a standalone sentence in this section of the text.

That the New Zealand Ministry of Education values e-Learning has been shown in the release of its comprehensive policy, *The 21st Century Learner: An e-Learning Action Plan for Schools 2006–2010* in 2006 and its antecedent policies. The apparent omission or backgrounding of ICT and e-learning in the draft national curriculum is intriguing. It could be an indication of one of two circumstances. The first is that the references to ICT are genuinely an afterthought – postscript additions to a completed text. The curriculum writers were perhaps focusing on structures and content and did not think of method or classroom implementation. Perhaps they simply did not value ICT as no mandate for schools or teachers to use ICT is articulated, merely advice suggesting what schools 'should' do. It can be conjectured that it would be possible to deliver the new curriculum in very old un-transformative ways. The curriculum and the e-learning strategy may simply have been developed by independent teams who were not apprised of each other's work in development.

The second circumstance is contingent on ICT or e-learning having become seamlessly integrated into the daily experience of schooling. In this situation, ICT simply does not need mentioning and schools do not need direct unequivocal advice on its use. This is a level of integration in which ICT has moved from the periphery to the mainstream and 'vanishes into the background' of the classroom (Fluck, 2003). It has, in essence, become oxygen.

This invisibility is similarly consonant with the seminal *Genres of Technics* (Ihde, 1979) which positioned human beings in a continuum of engagement with technology from intentional and reflexive correlations (completely external to it) to background relations that is, being completely surrounded by and oblivious to the technologies. At its extreme, what is created is a technological cocoon where the technology cannot be ignored because of our reliance or dependence on it.

Should the 'afterthought' circumstance be true, it could be said that the curriculum writers had an intentional or externalised relationship with ICT. Should the latter 'invisible' circumstance be true, then a background relationship has been demonstrated and a genuinely twenty-first century transformation has taken place. How the teachers who implement this curriculum read the omissions will depend on their own current understanding and relationship with technology.

Changing maps, same roads

If systems are as committed to transformation as we are led to believe, then should we not see policies as being new maps for new roads? Moyle (2005) noted that policy themes in Australia have changed since 1989 with the most significant changes being from teaching students computing skills to:

1. focusing upon social and structural issues of access for all students;
2. questions of whole school changes in teaching and learning; and,
3. issues concerning leadership, research and professional learning to support teachers.

She suggested that 'this changing landscape provides some pointers to

the evolving nature of the diffusion of computing technologies into teaching and learning' (p. 4). How far this landscape has changed is contestable and anecdotal experience would indicate that change has not been even across schooling sectors. It is cautiously contended that while the content or focus of policies has changed, their tenor and goals have not (see Lloyd, 2005). We see global demands for creative, technologically literate citizens capable of dealing with future change, but we do not see this embodied or mandated in pedagogy. We see ICT and e-Learning dealt with in ambiguous ways in curriculum documents. This usage is curiously at odds with the confident and expansive language used to describe the guiding visions of these documents.

Old maps, new roads

David Moursund (1999), in an editorial of *Leading and Learning with Technology*, proposed the Orwellian doublethink that although IT is changing rapidly, the powerful ideas which impact on education are changing slowly. To gauge whether or not the 'old maps' he suggested fit the supposedly 'new roads' identified by Moyle (2005) and articulated through 21st-century policy documents, this section of text will revisit Moursund's ideas with particular emphasis on what he had dubbed the '10 powerful ideas that are helping shape the present and future of information technology (IT) in education.'

Rapid change in technology

There is an interesting symmetry in almost concluding this discussion where it began, that is, with notions of technological change. Moursund (1999) had said that 'information technology (IT) is changing so rapidly that it boggles the mind and overwhelms the ability of most educators to keep up' (p. 4). Although the language is expansive, the sentiment still rings true and as noted through this article, is increasingly part of the consciousness of policy makers.

From observation, it would appear that the most significant changes in contemporary technology are (a) the convergence of 'computer-based, multimedia and communications technologies' (Toomey, 2001, p.1), (b)

the widespread diffusion of technology into private homes, (c) the advent of wireless and infrared networking, and (d) the emergence of mobile technologies through continuing miniaturisation. With these changes, unfortunately, comes an increasingly widening 'digital divide' (Annan, 2003) which must pose significant challenges for policy makers.

Powerful Ideas

Moursund (1999) believed that his ten powerful ideas were 'changing very slowly' and would serve teachers and students in both the present and 'far into the future' (p. 4). These ideas, essentially a disparate list of devices and processes, were (1) connectivity, (2) information appliances, (3) effective procedure, (4) user interface, (5) IT as integral part of the content of non-IT disciplines, (6) IT-assisted problem solving, (7) modelling and simulation, (8) communication in cyberspace, (9) empowering students through project-based learning (PBL), and (10) lifelong learning. For the purposes of this discussion, the ideas of (5), (6), (7) and (9) will be combined under the heading of 'enhanced learning.'

1. Connectivity

The 1999 definition of *connectivity* included global communication systems, mobile computing, and open access to information and people. Contemporary definitions would retain these components but would change their descriptors to acknowledge the changes in the technology itself. Moyle (2005) noted that a key theme in recent policy was to 'improve access, connectivity (i.e. bandwidth) and associated infrastructure' (p. 4) and, as previously noted, the Queensland Director General of Education and the Arts cited 'infrastructure and connectivity' as being one of the foundation elements in achieving the overall goal of preparing students for the information age (State of Queensland, 2004, p. 6). Within the MCEETYA suite of policy documents for Australia and New Zealand, those relating to connectivity include the Online Content Strategy (2004), Learning Architecture Framework (2003), Research Strategy (2003), and Bandwidth Action Plan (2003). It is clear, that despite some differences

in definition, connectivity has clearly remained a 'powerful idea.'

2. Information appliances (Norman, 1998)

Moursund (1999) noted the beginnings of 'a megatrend toward computers becoming invisible' (p. 26). This is consonant with the previously discussed notions of seamless integration and backgrounding (after Ihde, 1979) and technology fluency as 'oxygen' as young people are described as making almost subliminally automated use of technologies. This further supports the contention that 'when a technology reaches the appliance stage, the focus switches from learning the technology to learning to solve problems and accomplish tasks using the appliance' (Moursund, 1999, p. 26). The 'information appliance' can still be considered as a 'powerful idea' with the prime contemporary example of this being the mobile phone with its highly volatile diffusion through the community. It is also a clear exemplar of the convergence of technologies as evidenced through a contemporary Australian television advertisement in which pre-school children are shown a drawing of a phone and asked what it is. The ingenuous answers include a camera, a newspaper, and a television. The word 'phone' is the last to be heard.

3. Effective procedure

In the original text, an effective procedure was defined as being 'a detailed step-by-step set of instructions that can be mechanically interpreted and carried out by ... a computer or automated equipment. Procedural thinking includes developing, representing, testing, and debugging procedures.' (Moursund, 1999, p. 26). ICT remains algorithmic but software applications increasingly apply human-friendlier interfaces. An example of this are the animation programs which allow 'drag and drop' positioning of picture elements and automatically apply the algorithms for the tweening and morphing of images. Similarly, search strings in search engines are moving increasingly to formal natural language and more sophisticated filters are offered as default settings.

4. User interface

Moursund (1999) described user interfaces in terms of the significance of 'the graphical user interface [GUI] that includes the mouse', perhaps contrasting this to older systems which made use of command line interfaces and keyboards. User interfaces are becoming progressively simpler to use and adopt intuitive visual structures to facilitate audio and video editing. Voice and handwriting recognition are available but are not in general use in classrooms. Adaptive (assistive) technologies, however, are widely used and have been instrumental in mainstreaming students with disabilities. The notion of ICT and e-Learning as the teaching of typing is becoming less defensible.

5-7 Enhanced learning

- IT as integral part of the content of non-IT disciplines
- IT-assisted problem solving
- Modelling and simulation
- Empowering students through project-based learning (PBL)

What Moursund (1999) has listed sits well with contemporary thought as evidenced in Toomey's (2001) observation that, when combined with effective teaching, ICT plays a key role in better engaging young people in the learning process and in promoting improvements in literacy, numeracy, and higher order thinking. Problem-solving, modelling and simulation, and project-based learning remain cutting edge activities with the potential to promote the technological literacy, confidence, creativity and productivity espoused in the policies. Moursund (1999) singled out PBL as being an 'excellent vehicle for implementing constructivism, cooperative learning, and collaborative problem solving' (p. 24). All activities listed, however, meet this description.

In line with this pedagogical approach, there is an increasing emphasis on students being designers rather than users. Moyle (2005), in particular, has criticised the policy goals which speak of students, teachers and school leaders as 'users' of technology thus casting them into a 'passive mindset' (p. 8). There are

subtle but pervasive implications of this understanding in how activities for students are designed.

8. Communication in Cyberspace

Moursund (1999) included desktop publishing, e-mail, videoconferencing, and interactive hypermedia in this 'idea.' There has been increasing 'communication' in education with prime examples being the international *ThinkQuest* competition and projects, such as *Quest Atlantis*, which makes use of 3-D gaming worlds as learning environments. Similarly, there has been an acknowledgement of the need for online experience for students. For example, in the previously cited letter which accompanied the draft copies of the New Zealand Curriculum, the Minister for Education offered that the curriculum would help students to meet the 'demands of an increasingly diverse and interconnected community and globalised society.'

Such experience can be seen in the Pt England (Auckland) School's *Global Village Project* which has been described as being an:

... innovative project enabling the voice of Decile 1a children in Auckland to be heard around the world. Through a weekly podcast, Korero Pt England, students ... have become enthusiastic readers and writers and discovered that people across the globe are interested in what they have to say – so much so that in the last months of 2005 KPE was listed in iTunes USA in the group of Top Podcasts. (IT access demanded, 2006, p. 1)

10. Lifelong learning – anywhere, anytime

The 1999 annotation for lifelong learning suggested that 'IT has added new dimensions to learning, such as distance learning, computer-assisted learning, intelligent computer-assisted instruction, and learner-centered software' (p. 26). That this has remained a 'powerful idea' is evident in MIT's 2006 decision to make its courseware freely available online and the ongoing activity by private individuals in evolving Wikipedia, the free online encyclopaedia (<http://www.wikipedia.org>). The increasingly

prevalent use of intra- and extra-nets allowing greater student access to digital resources arguably stands to create a generation who accept, and expect, the openness described previously as being a 'hallmark of the information society. ... a crucial ingredient of democracy and good governance' (Annan, 2003, para. 2).

The ten powerful ideas identified by David Moursund in 1999 remain current, but a contemporary list might re-define some adopted terms and concatenate those related to learning into one, that is, 'enhanced learning.' What the list omits are references to the convergence of technologies and an acknowledgement of the digital divide with our using education and schooling to find equity in a world where, for some students, oxygen is technology and for others, is just oxygen.

Conclusion

This article has attempted to identify where ICT fits into future education and has done so through visiting the past and critically analysing the present. We must accept that we cannot know the future; we can only 'dip' into it based flimsily on what we understand of the past and what we value of the present. Uncertainty is our only certainty. Making expansive claims about technology is seductive – particularly through the lens of western affluence – but these will not help us to make real changes to education. Casting technology simultaneously as both the salvation and scapegoat for the future does not move us forward and instead, ties us to the old maps with which we are trying to chart new territory and to old roads which lead only to old destinations. Twenty-first-century education needs new visions, recharted roads and redrafted maps. Old visions, old roads and old maps will keep us where we are.

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Lyotard calls the 'new' knowledge's ability to *do* things its 'performativity' (see Lyotard, 1984).

13 For a complementary set of principles, see Lankshear and Knobel (2003b)

14 These are Prensky (2001)'s terms.

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