

# Exploring the Implications of the NBN for Education in Tasmania

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## Abstract

In 2009 The Australian Government announced the development of a \$40 billion National Broadband Network (NBN) with some of the first roll-out towns in Tasmania. The question of what the NBN rollout would mean for Education in the state led to the “NBN in Education” project, including interviews with experts in the field and a culminating forum. It became clear that the NBN in education is not a simple matter of connecting fibre to schools; rather it is a complex environment with many different perspectives and assumptions about learning, the value of learning technologies and the future of schools. This paper reports the research approach associated with the project that helped a group of e-learning, professional learning and ICT leaders to engage with the issues. The frameworks developed to help this process may be valuable for others involved in engaging stakeholders in conversations about the implications of the NBN.

**Key words:** National Broadband Network, e-learning, connectivity, values

## Introduction

In 2009 The Australian Government announced the development of a \$40 billion National Broadband Network (NBN) with some of the first roll-out towns in Tasmania. As Tasmanian towns become progressively more connected to high speed broadband key research questions are: what are the implications for education in the state? How might high speed connectivity help bridge the current educational divides between rural and urban areas? What educational affordances might high speed connectivity offer and is the educational sector ready? What might be the issues and challenges?

At the time of the announcements and subsequent information forums there was little information or research directly related to implications of such a broadband rollout for education in Australia. The NBN corporate brochure (NBN Co, n.d.) titled “Nation Building Infrastructure: Broadbanding Australia - National Broadband Network” mentions education four times and states, “The NBN is not just delivering speed, it also brings ubiquity. A network that connects all Australians to broadband will transform access to health and education” (p.2). The Federal government’s Digital Education Revolution (DEEWR, 2008, 2009) offered opportunities but the analysis of these initiatives only came later (e.g., Buchanan, 2011).

The authors are educators and do not claim to be ICT or e-learning experts; their collective experience involves regional issues, inclusion, pedagogical research in mathematics, ethnography, holistic education and trans-disciplinary research. The authors as researchers were concerned to find out more about what was actually happening regarding the current use of ICT in education in Tasmania, at different levels and in different sectors of education and training; to investigate the visions for the future of those playing leading roles in this area and to help stimulate conversations about related issues among them. These conversations were seen to be an important prerequisite to the effective implementation of policies and practices surrounding the advent of the NBN.

The Tasmanian NBN in Education Project was begun in late 2009 with the aim of holding a series of intensive interviews with key ICT leaders. The interview program was to culminate in an expert forum of interview participants and other invited ICT experts in 2010 designed to explore the issues raised in the interviews. The 21 people interviewed represented perspectives of e-learning, regional education, ICT support, school leadership, professional learning and policy from all sectors of education.

From the first the interviews made clear the complexities of the issues surrounding the potential impact of the NBN rollout on teaching and learning. It became evident that the NBN in Education was not a simple matter of connecting high speed cable to schools or educational organizations. Rather it was a complex environment of many competing tensions at many levels, with practical day-to-day decisions not necessarily being informed by a holistic overview of the issues. The NBN in Education had the characteristics of a “wicked” problem – multiple stakeholders, multiple dimensions, and a quickly changing environment. Analysis of interview transcripts, research team discussions and participant feedback through the project’s Wiki website, using a causal layer methodology (Inayatullah, 1998), illuminated some of the key dimensions of the action research problem. These are depicted by two main models: seven key perspectives that needed to be considered and an

underpinning spectrum of values that were driving behaviours resulting in different ways of framing “the problem.”

The forum was held in December 2010 to explore a state-wide approach to e-learning using the two models presented in this paper, as discussion points to help frame the issues. The forum was welcomed by participants as a rare opportunity to think expansively and deeply about a complex environment away from the practical realities of the classroom or management situations. The participants identified issues beyond e-learning that go to the heart of the way people think about schooling and learning, and the relationships with the many stakeholders involved. Forum participants recommended a cross-sector strategic approach that takes into account the different perspectives and values, with implications for shared policies and practices into the future.

## **Methodology**

The action research approach was chosen to observe a complex situation and also to intervene in it by bringing together ICT leaders, teachers and policy makers for conversations many had not been able to have previously. This potentially built social capital among participants in ways that would stimulate ideas, encourage new networks and connections and build a sense of shared ownership and reflexive involvement. By the time people attended the forum they had already invested in the process and were ready to take the project forward.

### ***Timeline***

The interviews commenced in November 2009 and concluded in March 2010. The data arising from the interviews were then analysed in March/April 2010 resulting in the creation of a number of models to give insight into the complexity of the issues.

A meeting with six of the interviewees, representing e-learning leadership across a range of different organizations, was held in May 2010 to review findings and the models. This “steering group” recommended that the planned forum should have a focus broader than the NBN implications alone. The interview and feedback process had demonstrated an absence of a coherent e-learning strategy for the state, and suggested that more broadly-based questions about the future of education in a digital world were worth exploring.

One of the authors and two of the interviewees presented the interim findings of the NBN in Education project at the *CSIRO Broadband for Society Summit*<sup>1</sup> in November. This

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<sup>1</sup> [CSIRO: Broadband for Society Summit](#), Nov 2010

enhanced the understanding of the broader issues affecting key players outside as well as inside education, the emerging drivers and alternative ways of framing the issues. These new understandings were then used to inform and structure the forum, which was held in December 2010.

### **Participants**

A modified snowball technique was used to identify potential interviewees and to gain their nominations of other “experts” as potential interviewees. Initially five leaders of ICT within different organizations were identified using research knowledge and networks. The density of the relevant networks was demonstrated by the fact that some people were nominated several times by others. The “gaps” in the interview lists were illuminated so that we then actively searched for those representing missing perspectives.

The 21 interviewees were drawn from public education K-12, the independent and Catholic school sector, the University of Tasmania, the Community Knowledge Network, the youth issues sector, and the vocational sector. Table 1 details the numbers of people from each sector and their roles.

**TABLE 1 - Interviewees**

Education Sector	Number	Interviewees
Public Education K-12 (over 220 schools, 9 colleges)	8	District learning leader responsible for state-wide e-learning strategies, state-wide professional learning leader, network manager, 2 High School leaders, e-school leader, flexible learning leader for the Academy (year 11 & 12) and board member for the Academy
Independent and Catholic Schools	1	Representative for the sector from The Hutchins School (who were already connected to high speed Broadband)
Vocational sector Post year 10	4	Board member of the Polytechnic, flexible learning leader for the Polytechnic, ICT resource manager (for the Academy and Polytechnic), the e-learning leader from Skills Tasmania (a hub for Registered Training Organizations (RTOs) across industry and government departments)
Youth Services Sector	1	Clearinghouse for Youth Studies – hub for the sector
University	5	e-learning leader, ICT resource manager, flexible learning facilitator, Prof of ICT, Faculty of Education ICT lecturer
Community Knowledge Network	2	Director of Library and Access Centres, Leader of Adult Learning

## ***Instrument***

Our challenge was to create an interview schedule that could be used equally well person to person or over the telephone and that would be at once broad enough for everyone to answer and yet specific enough to enable them to talk about their particular situation in detail. We wanted to go beyond “what might be the implications of NBN for you?” to get a sense of the current educational vision informing the organizations and where e-learning and NBN might sit within them. Of particular concern were the innovative approaches, learning edges and the future directions of the organization. We were interested in existing and potential issues, whether technical or human. We sought feedback for our questions before trialling them in interviews. A summary of the questions is found in Table 2. They proved very effective in opening up conversation, though not all interviewees were able to respond to all questions. Ethical clearance was gained from the Human Research Ethics Committee, University of Tasmania, and the interviewees were able to withdraw and to withdraw their interview transcript at any time.

**TABLE 2 – Interview Questions**

1. What is the current use of ICT to enhance student learning? Challenges?
2. What are the leading edges in your organization?
3. What potentials do you see for ICT in education with the advent of NBN?
4. What is the impact of ICT on disadvantaged students?
5. How might learning environments change?
6. What professional learning networks exist or could exist to support new learning initiatives?
7. What are the issues surrounding teacher professional learning in ICT?
8. What do you think the NBN delivers?
9. What might be technological limitations?
10. What is your organization's strategic vision for ICT in education, if it has one?
11. How does your organization's vision connect with those in other sectors?
12. What metaphor best describes your organization's vision?
13. What would you like to share at the forum? And what would you like to hear about?

## **WIKI**

The research method involved a dynamic process for engaging people in a conversation, among themselves as well as with us, during which the “process” of information and ideas exchange and flow became as important as the research “product” in the form of reports and academic papers. To this end we decided to use a WIKI platform<sup>2</sup> where the summaries of the interviews would be put on-line and made available for the interviewee to correct or change (which some did), and accessible for the other participants to view and discuss in person or on line. Some interviewees took advantage of the access to other participant interviews and followed up by building new relationships and networks that led to project collaborations with other participants. This was also promoted by the interviewer (the first author) who was able to suggest potential beneficial connections.

The interviews planned for 30 minutes usually lasted longer, sometimes for 2.5 or 3.5 hours. This indicates the complexity of the topic, the interest level of the participants and the in-depth exploration of the issues. The interviews were mainly conducted at the interviewees’ places of work so they were able to provide demonstrations, documentation, power points or diagrams, adding to the richness of the picture that was being developed. The interviewer used a hermeneutic process, giving the interviewee opportunity to help refine the meaning that she was making. The interview was summarised according to the question categories on the WIKI. In general people did not modify the substance of what they said on the WIKI, demonstrating confidence in the reliability of the reporting of the interviews.

## **Observations**

Interview conversations revealed that interviewees had only moderate information about the specifics of the NBN as they related to their sphere of operation. They were keen to find out more, and to explore the implications for education with other interviewees. Although Tasmania is a small state, it appeared that people were often isolated within their organizations as well as from other educational organizations, operating in “knowledge silos.” It appeared that those engaged in the pedagogy and those providing the supporting technology and infrastructure operated across a divide, especially in terms of where decisions were being made and what was informing them.

The interviews also revealed different perspectives and different ways of framing issues. Some interviewees suggested that a solution to poor school connectivity was to

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<sup>2</sup> <http://tasnbn.wetpaint.com>

provide a whole-of-education network to support learning, whereas others framed the issue as a need for end-to-end performance that may involve other solutions. Still others wondered why education remained within a paradigm where the institutions are responsible for the ICT provision when the potential for future connectivity networks centres on individual devices connected to a public network. The variety of conceptual starting points, perspectives, and desired end points helped to shape our analysis approach.

### ***Analysis***

Our original intent was that the research component of the project would stop after the interviews had been conducted and that people coming to the forum would read the individual interviews beforehand to get a sense of each other's views and issues. Although the interviews usefully provided a sense of the organizations at a particular point in time, we did not feel that by themselves they could explain the complexities of the issues. The implications of the NBN for education reflected the educational and organizational cultures and value systems of the people tasked with implementation. Tensions sometimes resulted from this in approaches to problem solving. The many dimensions and perspectives had all the characteristics of a wicked-problem: uncertainty, continuing change, complexity from the multiple activities and interactions across multiple scales, multiple and contested interpretations of the problem, and multiple and contested solutions with possible perverse effects (Rittel & Webber, 1973). It was thus difficult to progress to common definitions of problems and shared solutions without delving deeper into the thinking and value cultures to help people develop beyond these (Beck & Cowan, 1996). "Agonistic" processes allow different perspectives to be kept alive without reducing them to one view or simple solution (Frame, 2008). We decided, therefore, to use analysis that could capture more than just the surface issues and enable people to engage in triple loop learning (Flood & Romm, 1996).

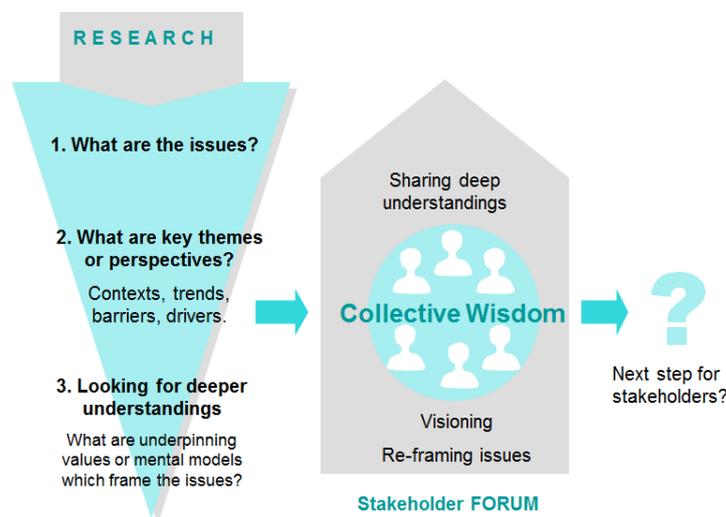
*Causal Layered Analysis* (Inayatullah, 1998) aims to go beneath the issues and challenge existing frames and worldviews to help people into a new visioning of the future. There are four layers of analysis and we used these to give shape to our analysis approach.

1. *The issues layer* – this captures issues and concerns that people raised in the interviews and subsequent meetings.
2. *The social analysis layer* – this focuses on understanding the dynamics and dimensions of the issues, determining key perspectives or lenses to consider the issues, acknowledging that each person's perspective is an important part of a greater whole, and illuminating the drivers, trends and situational contexts.

3. *The worldview or values layer* – this relates to understanding cultural motivations and values and the way different people frame issues, aiming to reveal unquestioned assumptions.
4. *Visioning/metaphor layer* – this encompasses being able to move into a space where underpinning values may have changed and being able to articulate alternative possibilities.

Drawing from the interviews we created the analysis for the first, second and third layers, including the development of two models. These layers were used to inform and structure the forum, thus encouraging the participants to move to the fourth layer of visioning. This is shown diagrammatically in Figure 1 as applied to this project.

**Figure 1 – Layers of Analysis.**



## Results

### ***The issues layer: What are the issues?***

A range of issues emerged from the interviews. We briefly flag some of them here. They are discussed more completely in Stack, Watson, Abbott-Chapman (2011).

**Connectivity.** Lack of connectivity for many educational institutions prevents engagement with current demands for e-learning quite apart from high bandwidth applications such as video conferencing, immersive worlds, data set visualisation and manipulation and remote experimentation. In the case of public institutions (schools, colleges, polytechnic, libraries, and adult education) barriers to connectivity include budget constraints to reduce the cost of internet, limited bandwidth connection, filtering/security

issues and the contractual arrangements of being part of the whole of government network. Creating connectivity for Tasmanian learners is complex, not just related to technology, and needs to consider whether existing paradigms of institutional provision will be the optimum for the future. Although the NBN might be an option for schools in providing high speed bandwidth it does not solve the cost constraints or other issues. *How might an agile system be created where teachers and students can enjoy the affordances of high bandwidth e-learning?*

**Digital Divides.** There is an increasing digital divide between home and school, between public and private schools, and between those who use technology and those who do not. While public schools are experiencing e-learning restrictions, most students at home can currently access the equivalent bandwidth of an entire school. Private schools are beginning to connect to AARNet<sup>3</sup>, the high speed bandwidth network for the university sector, giving unprecedented connectivity. Meanwhile there are still many people who are not engaging with the digital revolution and there are likely to be increasing economic and participation gaps between the connected and disconnected. Digital access needs to be supported by development of digital media literacy to deal with the challenges of the new participatory, media-oriented culture. *What are the options that enable all students to experience connected learning?*

**Relevance of Schools.** The relevance of the current role and organisation of schools is being challenged as a result of students having access from home to high quality open courses, engaging interactive learning technologies and networking to communities of interest. There are likely to be new roles of schools in the future. A number of interviewees speculated about the changing roles of teachers and learners as co-creators of knowledge. Virtual learning gives us the opportunity to reimagine the nature of schools as part of the “Big Picture” linked with other knowledge sharing and creating “learning hubs.” *How might education leaders engage students, teachers, parents, business and the community in conversations about the future of learning in a connected world?*

**Innovation.** It is important to support innovation of learning spheres, technologies and pedagogies through technology support, policy and funding. Innovation in e-learning has put institutions in an excellent position to take advantage of high speed broadband but these need to be strategically supported to utilise future developments and opportunities with

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<sup>3</sup> AARNet is a very high bandwidth network (10GB/s) designed to connect higher education research institutions globally. It uses a subscription per student costing model, rather than cost per download volume. It is more than just a carrier; also includes on-net services such as Clickview.

technology. Innovation in ideas, visions and problem solving need to be better matched with technological innovation for the opportunities that the NBN offers to be seized. Innovative individuals need to be supported by innovative systems. *How might systems and policy support innovation that acts to vitalise the whole?*

**Scaling up.** Educators already know many of the educational affordances of high speed bandwidth. E-learning is far more than just using interactive technologies to engage students within their accustomed milieu; it can deliberately enhance development, learning and citizenship. The challenge is scaling up in vision as well as technology. This requires connectivity solutions and technological support, as well as support for cultural change in teaching and learning practices. *How might the education sector effectively scale up while still enabling diversity and being mindful of teachers' needs?*

**Cross-sector e-learning strategy.** There is no current cross-sector state-wide strategy for e-learning in Tasmania, but the beginnings for this are on the drawing board. Although individual institutions have their own forward looking e-learning plans the relative lack of an overall co-ordinated approach for a whole-of-education network means that ways of managing open resources, encouraging innovation, collaborating between institutions, and identifying and addressing common issues are as yet embryonic. In times of increasing economic stringency the need to avoid duplication of ideas, initiatives, effort and organisation have become imperative, yet the cross-cultural issues and values are impeding progress. *How might educators develop a collaborative cross educational sector vision/strategy for e-learning?*

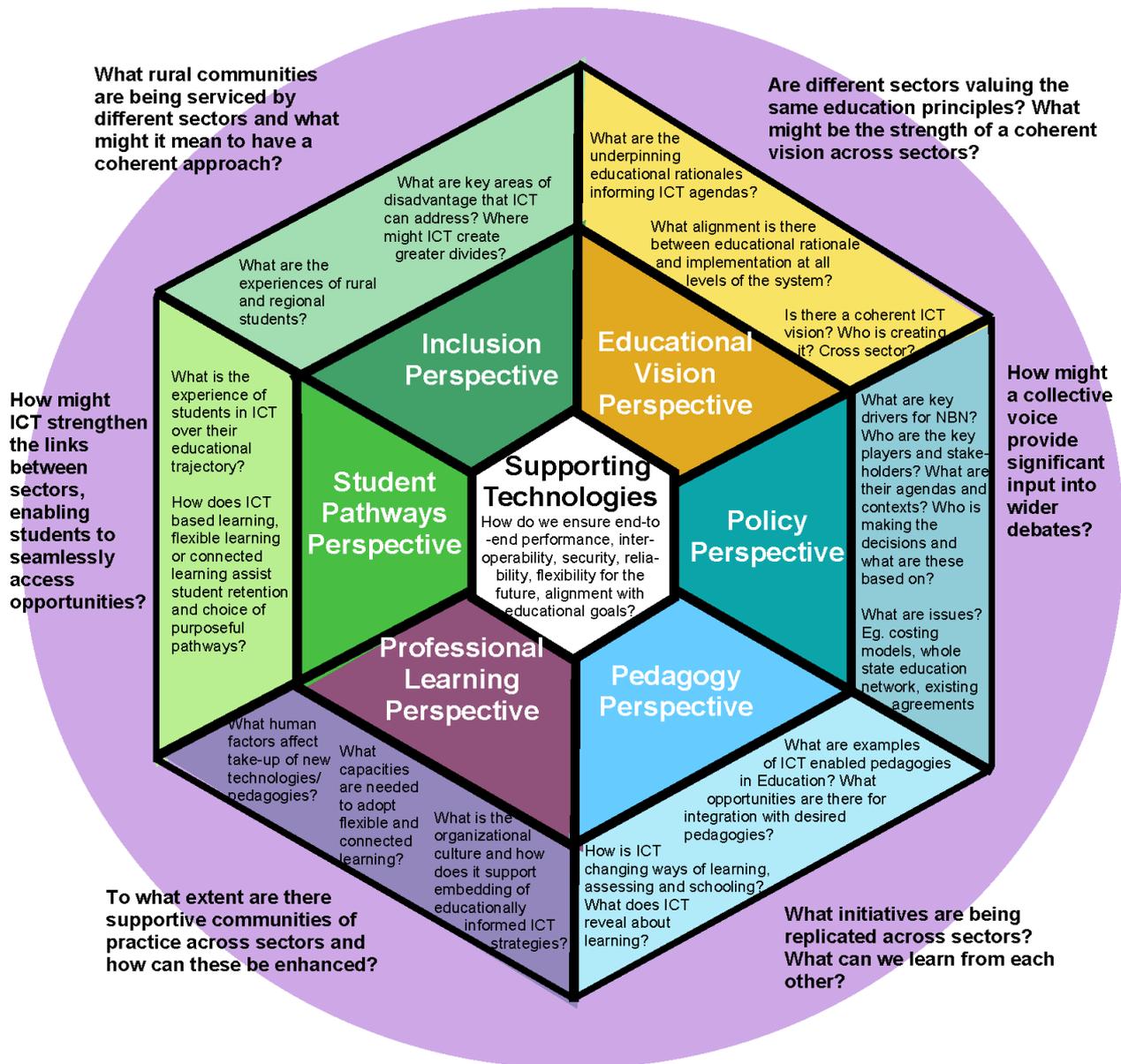
### ***The social analysis layer: What are the key perspectives?***

The perspectives model, shown in Figure 2, emerged from the syntheses of issues discussed above. The model depicts seven standpoint perspectives that we believe will become increasingly important in informing decision-making around the NBN and e-learning in general.

- *Educational vision* – What are the underpinning philosophies of education (such as one-child-at-a-time policy) in different institutions? Is there alignment between vision and provision within institutions? How might educational philosophies and their supporting technologies align with the nature of a connected learner: someone who requires open access, is always connected, expects personalised learning, is looking for wholeness and immersive experiences, and contributes as an active citizen? Can virtual learning enable educators to re-imagine schooling and “always on” learning in the wider community?

- Inclusion** – How might inclusion be re-conceptualised, discarding the old paradigm of “equity groups” that label and stigmatise, and move to an individual learning needs and learning contribution policy that links with the educational vision stated above? How do we ensure fair e-learning for all, particularly in regional areas? <sup>4</sup> Although institutions have inclusion policies for those that “attend” a learning centre, a key challenge is to engage with those who are not part of formal learning, or who are not “connected.” How might education build literacy, digital literacy and digital citizenship learning opportunities for all? How might the NBN provide opportunities to work in new ways with students disadvantaged by vertical or horizontal stratification of opportunities? How can the valuable aspects of local “place” attachment and identity be preserved while putting students at the centre of global borderless learning networks?

**Figure 2 – seven perspectives of NBN in Education**



- *Pedagogy* – What are the affordances of new learning technologies? What is their impact on pedagogy? Many of the new learning technologies involve teachers moving from teacher-directed pedagogies to student-centred ones, requiring shift in practice, roles and change in teaching and learning culture. How might teachers' professional learning convey the affordances of technologies in a way that connects deeply to what they value as teachers?
- *Professional Learning* – What professional learning is needed to assist teachers, educators, managers, technologists and policy makers to understand the potential challenges and benefits of maximising affordances of the new technologies? How might cultural change across sectors be supported coherently? How might collaborative agility in development of e-learning capacities be developed?
- *Student Pathways* – How might the different educational philosophies of different organizations shape the technology experiences of students at these institutions? How might technology encourage or hinder movement between institutions? What is the portability of student work?
- *Policy* – Who are making ICT and e-learning decisions and what is informing the decision-making? Who has the mandate for working in this area? What are the policy contexts and how might they enhance or hinder? What infrastructure might support a more co-ordinated approach?
- *Supporting Technology* – What is needed in terms of provision of or access to networking, bandwidth, learning platforms and applications to support pedagogy, inclusion, educational vision, professional learning and student participation, as discussed above? High bandwidth speeds will provide many technological solutions enabling far more cloud management; the challenge is, how will this enable access to high bandwidth providing end-to-end performance?<sup>5</sup>

These are not isolated perspectives but rather they inter-relate. In the interviews one person covered all of these perspectives in her role, but more frequently people were focussed on one or two areas. Decision-making power around connectivity issues was primarily located in the *Supporting Technology* and *Policy* perspectives (the ICT leaders and Finance people) rather than learning leaders.

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<sup>5</sup> To see detailed cross-sector analysis of all these perspectives see the WIKI: <http://tasnbn.wetpaint.com/page/Analysis>

When this model was introduced at the forum it provided a foundation for each person's unique perspective by allowing each person to see beyond the constraints of organisation and resourcing to a greater understanding of the whole. It also acted to diffuse potential tensions springing from different viewpoints.

***The worldview or values layer: What are underpinning values?***

The second model (Table 3) explicates a spectrum of operating cultures, motivations and values in the e-learning arena drawing from an existing Spiral Dynamics framework (Beck & Cowen, 1996). The idea for using this framework emerged from one of the later interviews with an ICT resources manager whose interview seemed to progress through these different value systems, naming multiple and often competing values under which he was trying to operate and where, if given enough time, he would like to operate in the future.

**TABLE 3 – Spectrum of operating cultures**

<p><b>Survival</b> – reliable access, on-line safety, time to complete tasks, basic ICT needs, resilience, digital literacies; <b><i>innovation born out of necessity.</i></b></p>	How can we ensure connectivity for all?
<p><b>Tribal</b> – different groups with different milieus, languages and values (e.g., digital natives, digital immigrants); traditional or habitual ways of operating; legacies of the past; urban myths; conformity to a group; sense of belonging and culture; learning communities; <b><i>innovation to belong.</i></b></p>	How do we take account of different groups and benefit from the power of groups and community?
<p><b>Break-out</b> – drive, passion, energy for change, exploration, play and creativity, re-mix, risk-taking; recognition of previous assumptions and limitations; spontaneous, bold, opportunism that may become irresponsible risk-taking or power play; <b><i>innovation for playfulness or to break down barriers.</i></b></p>	How do we encourage vitality of expression?
<p><b>Order</b> – centralisation; control, one solution, coherence, standards, interoperability, structures; body of knowledge; factory model of schooling; system over individual; <b><i>innovation in system solutions (policy, infrastructure).</i></b></p>	Where can we most effectively provide central coherence?
<p><b>Corporate</b> – strategic planning, productivity, value for money, responding to clients' needs; evidence based; self-directed, achievement oriented, entrepreneurial, meta-cognition of self and organizational processes; applied learning, problem solving; team work, task or product oriented; <b><i>innovation to find points of advantage.</i></b></p>	How can we enable prosperity and individual empowerment?
<p><b>People Oriented</b> – caring, sharing, listening; diversity, plurality, inclusion; deep relationships, being ethical, building social capital; making meaning together, deep understanding; enabling voice and agency; self-aware, discerning; critical of disempowering structures, practices and relationships; critical literacy, postmodern perspectives; processes; <b><i>innovation for social change.</i></b></p>	How do we create cultures of care, support social justice and develop global citizenship?

<p><b>Integral</b> – agile, adaptive, reflexive, dialectical; system-aware, trans-disciplinary, understanding complexity and underpinning paradigms; looks at unique contribution to whole; presencing, turning points; insight, social foresight; <b><i>innovation in sustainable transformation.</i></b></p>	<p>How can we understand and ensure the health of the whole system?</p>
<p><b>Holistic</b> – deep connection to the world and the universe; wise action for living in the world; drawing on many ways of knowing and being; visionary, dreaming the possibilities into life; expanding consciousness; awe and wonder, fulfilment, happiness; <b><i>innovation of new imaginaries.</i></b></p>	<p>How can we connect deeply and contribute to the potential of the whole?</p>

In a separate document<sup>6</sup> a number of ICT issues are mapped against this values framework, considering perspectives of students, teachers and system support. Although the values framework is exploratory it provides a useful heuristic device to reflect upon the underpinning values behind certain ways of framing issues, policies or actions.

The key to understanding this framework is the notion that multiple value cultures co-exist. Each can be expressed positively or negatively. To enable the vitality of the whole system a healthy expression of each value culture is needed, rather than collapsing to one value culture. It is this diversity that builds a more resilient system.

People may tune into different value cultures as a result of their roles, and find it difficult to reconcile some agendas coming from another value culture. In the education arena there is a suggestion that certain value cultures and approaches (particularly the *order* and *corporate* value cultures) are colonising others, causing unhealthy reactions and potential conflict. A *people-oriented* approach to teaching that values relationships, meaning and processes might, for example, be at odds with a *corporatized* model requiring measurable products, set teaching plans and performance indicators.

The centralisation of technology support (*order* value culture) on one hand provides efficiency through uniformity yet on the other hand may impact on the ability of individual campuses or schools to respond to local needs or issues. There is, however, a significant role for central bodies to guide implementation of ICT providing a more systemic approach. The *Australian Flexible Learning Framework*<sup>7</sup>, for example, for vocational education has addressed many of the value cultures by:

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<sup>6</sup> See [Spiral Dynamic Analysis of ICT in Education.doc](http://tasnbn.wetpaint.com/page/Analysis) at <http://tasnbn.wetpaint.com/page/Analysis>

<sup>7</sup> <http://www.flexiblelearning.net.au/>

- providing funding (*survival*) and professional learning to support teacher champions to innovate and *break-out* from existing teaching cultures and build capacity within their organizations,
- establishing learning communities (*tribal*),
- creating strategies for *corporate* leaders to use in supporting innovation,
- developing standards to build inter-operability of systems (*order*), and
- providing an on-line learning resource repository for teachers to share and re-mix resources (*order*).

Many of participants found the values framework very useful and recommended that it be used in strategic planning as well as helping to communicate to others the various affordances that e-learning might enable. The danger of using models and frameworks, however, is that important understandings or questions might be missed because they do not quite fit the model (Edwards, 2009). They are a visual tool or lens to help people map greater wholes, while providing some coherence to issues that may be initially too complex to make sense of. They provide temporary scaffolding to a more nuanced understanding.

### ***The visioning/metaphor layer: The Forum***

The one-day forum was designed in collaboration with three participants, and funded by the Department of Education. Ten of the original interviewees were able to participate and a further 12 people represented the different perspectives. The intention was to build a deep understanding of the issues through using the models to illuminate the issues, helping people to reframe the way that they might be seeing the issues, and then to move into a more visionary space to imagine the future. In creating the architecture for the forum<sup>8</sup> we included:

- framing the problem as a wicked problem,
- opportunities for people to bring their current issues and situate these within the perspective model,
- a larger narrative of some of the issues where key leaders could provide part of the story, enabling a sense of coherence,

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<sup>8</sup> The forum power point: <http://www.authorstream.com/Presentation/regor2012-710228-tas-nbn-forum/>

- introduction to policy contexts, information about high speed broadband options and opportunities, and a brief look at future trends<sup>9</sup> and what other broadband enabled countries<sup>10</sup> are doing,
- opportunity to relate the issues back to the values framework, and
- opportunity for brainstorming and looking for ways forward.

The forum was welcomed by the participants as an opportunity to think expansively and deeply about the issues. The analysis had provided a base where people could value different approaches because their differences were already acknowledged as a necessary part of a bigger whole.

A key element that grounded the discussion was being able to discuss what was valued in terms of educational outcomes for students. Participants provided many inspiring stories of what their students were able to do with new technologies and in some cases, such as The Hutchins School, with high speed bandwidth. Rather than just speaking in terms of technologies – such as E-portfolios, virtual worlds, YouTube videos, serious on-line games, on-line storage, video conferencing, and cloud-sourced applications – the conversations were more linked to what students gained from these. Early in the day we provided a spectrum of educational affordances that we had created from the values framework:

- enabling safe access and use (e.g., digital literacies),
- helping students to connect to different learning communities,
- expressing passion and creativity, taking risks, innovating,
- sharing collective knowledge,
- productively contributing to the world of work and the development of work related skills,
- developing empathy, social justice, self-understanding, critical inquiry,
- seeing and contributing to higher perspectives of the whole, and
- relating profoundly to the universe, planet and humanity.

This range of values was very useful in helping people to situate their stories within different value cultures, although acknowledging that other people might be focussing on others. It

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<sup>9</sup> Drawing on reports such as the **Horizon Report** <http://wp.nmc.org/horizon2010/>, **Smart Services CRC** futures <http://www.smartservicescrc.com.au/ViewVideo.html?v=141&c=Di2O>, **2020 Forecast: Creating the future of learning** <http://www.futureofed.org/>

<sup>10</sup> For example, **Report of the Digital Britain Media Literacy Working Group 27 March 2009** <http://stakeholders.ofcom.org.uk/binaries/research/media-literacy/digitalbritain.pdf>

was realised by the group that we are not good at explicitly articulating these values in such a coherent way; the values needed to be embedded within policy frameworks and be used in helping teachers understand the potential of learning technologies.

The participants recommended<sup>11</sup> a number of strategies to take forward from the forum, including:

- advocating the need for greater connectivity in education;
- communicating for cultural change in teaching and learning, aiming to change values in this arena, encouraging re-imagining of what schools might be for;
- networking across sectors, including facilitating working parties that look at common issues and the provision of a cross-sector e-learning person responsible for driving a coordinated approach;
- using thinking tools such as the perspectives and values frameworks to assist strategic planning; and
- developing a Tasmanian approach to open education resources, and better ways of sharing resources across sectors.

Although the forum was highly successful in creating an opportunity for sharing within a big picture framework, time ran out to move into a truly visionary space where we could create and explore potential futures as was intended using the Causal Layered methodology. The forum achieved the aim of sharing deep understandings and re-framing the issues, but it was clear that more collective time was needed to explore the complexity without falling back into old ways of thinking, doing and envisioning the future.

## Discussion

When we started the project we intended to facilitate a beginning dialogue on the implications of the NBN for education in Tasmania. It rapidly took on a much broader scope, however, providing an opportunity for participants to reflect on where e-learning is now, what is valued about it, and what might be the challenges for the future. In framing the problem as a wicked problem, and providing coherent frameworks and springboards for thought and action, we enabled participants to explore diverse perspectives, encouraging them to engage in wider conversations and decision-making. By creating a situation of trust between the researchers and interviewees we also enabled participants to surmount the inevitable institutional and cultural barriers to shared thinking and problem solving. The process we

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<sup>11</sup> [forum.summary.docx](http://forum.summary.docx) at <http://tasnbn.wetpaint.com/>

used, including the use of the WIKI, engaged key stakeholders at each stage of this project as research partners and knowledge creators. This resulted in an ownership of the issue and a desire to move it forward collaboratively, as well as individually within their own institutions. For some, however, it has been difficult to do because of a lack of mandate within their organizations to be involved in a cross-sector conversation, or lack of recognition that innovation is more than a technological solution. Economic constraints also restrict the power to move in new directions.

Pruitt and Waddell (2005) suggest key roles for those dealing with complex problems at a governance level: bridging adversarial positions, brokering resources and activities, building learning communities, consensus building, promoting cross-sector collaboration, strengthening actors (to play a role in system transformation), and building systemic awareness amongst actors. E-learning leaders in particular are important bridges between ICT, corporate hierarchy, teachers and the community. Our role in this milieu became one of building *systemic awareness* amongst key ICT and e-learning leaders, and in some cases *strengthening them* to play a more active role in system transformation. This is not our area of responsibility, however, and although we were able to provide a timely intervention, our role cannot be sustained. To what extent does this need a co-ordinated approach and to what extent can it be left to emerge? Each institution and organisation in concert with others must come to their own solutions and their own ways of re-imaging schools, creating forward-thinking policies, engaging stakeholders at every level, increasing funding for research in this area, and putting students first, using social network and media oriented approaches (Searson, Jones, & Wold, 2011).

The frameworks and models presented in this paper are not specific only to Tasmania but would be transportable and applicable to other groups in Australia who are considering the issues associated with connectivity, e-learning and the future of schooling. The perspectives model can be used to invite a diverse range of people to have discussions around e-learning, even if they do not consider it their special area. This model requires technology to be contextualised within a far bigger socio-political and educational picture. Using agonistic processes ensures the diversity of perspectives is valued rather than a stumbling block and helps to create novel ways to frame the issues. The values model, particularly the condensed spectrum of affordances, provides the opportunity to vitalise conversation, reminding people of what is good, true and beautiful about education. The model can act as a powerful explanatory device for understanding where energy in a system is centred, and how different value cultures might be used positively and collaboratively to

channel that energy towards the achievement of new solutions to persistently wicked problems.

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### **References**

- Beck, E.D., & Cowan, C.C. (1996). *Spiral Dynamics: Mastering values, leadership and challenge*. Maldeen: Blackwell Publishing.
- Buchanan, R. (2011). Paradox, promise and public pedagogy: Implications of the federal government's Digital Education Revolution. *Australian Journal of Teacher Education*, 36(2), 67-78.
- DEEWR. (2008). *Success through Partnership: Strategic plan to guide the implementation of the Digital Education Revolution initiative and related initiatives*. Retrieved from <http://www.deewr.gov.au/Schooling/DigitalEducationRevolution/Pages/default.aspx>
- DEEWR. (2009). *Professional development for teachers*. Retrieved from <http://www.deewr.gov.au/Schooling/DigitalEducationRevolution/Pages/ProfessionalDevelopmentforTeachers.aspx>
- Edwards, M. (2009). *Organizational transformation for sustainability: An integral metatheory*. New York: Routledge.
- Frame, B. (2008). 'Wicked', 'messy', and 'clumsy': Long-term frameworks for sustainability. *Environment and Planning C: Government and Policy*, 26(6), 1113-1128.
- Flood, R., & Romm, N. (1996). Contours of diversity management and triple loop learning. *Kybernetes*, 25(7/8), 154-163.
- Inayatullah, S. (1998). Causal layered analysis: Poststructuralism as method. *Futures*, 8, 815- 829.
- NBN Co. (n.d.). *Nation Building Infrastructure: Broadbanding Australia → National Broadband Network*. Retrieved [16/6/2011] from <http://www.nbnco.com.au/wps/wcm/connect/main/site-base/main-areas/publications-and-announcements/announcements/nbn-info-pack.html>
- Pruitt, B., & Waddell, S. (2005). *Dialogic approaches to global challenges: Moving from "Dialogue Fatigue" to Dialogic Change Processes*, retrieved [13/05/2011] from

<http://www.redesedesenvolvimento.org.br/filemanager/download/484/Dialogic%20Approaches%20to%20Global%20Challenges.pdf>.

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, 4(2), 155-169.

Searson, M., Jones, M., & Wold, K. (2011). Reimagining schools: The potential of virtual education. *British Journal of Technology*, 42(3), 363-371.

Stack, S., Watson, J., & Abbott-Chapman, J. (2011). *The challenges of creating connectivity for Tasmanian education: The NBN in Education project*. Unpublished report. Hobart: Faculty of Education, University of Tasmania.

Wilber, K. (2000). *A theory of everything: An Integral vision for business, politics, science, and spirituality*. Boston: Shambhala.