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Review of the National Innovation System - Submission  
Secretariat to the Expert Panel,  
Review of the National Innovation System,  
Department of Innovation, Industry, Science and Research,  
GPO Box 9839,  
CANBERRA, ACT 2601

Education.au is pleased to be able to provide the DIISR a submission regarding the 'Review of the National Innovation System'. In an environment that is constantly changing it is important for organizations and indeed countries to develop strategic and competitive advantage through innovative practices and cultures.

As a national agency funded through education and training ministries in Australia, the company has been required to network and collaborate to bring together innovative practice in the education and training setting. It is with this background of experience and expertise that we are extremely excited by and are very supportive of a government that invests in innovation and structures to support same.

We wish the panel success in its deliberations and look forward to the outcomes in the near future.

Yours sincerely

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General Manager



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Submission by Education.au

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**Declaration of interest**

Education.au is owned by all Australia's ministers of education and training.

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## About Education.au and innovation

Education.au ([www.educationau.edu.au](http://www.educationau.edu.au)) is a not-for-profit ministerially owned agency, governed through a Board by nominees from the Australian Government, higher education, school education, and vocational education and training sectors.

The agency focuses on the needs of Australian education, training and careers within the context of emerging information and communications technologies (ICTs) and standards as they apply to the Internet. It provides innovative, leading edge solutions, trials new technologies, reviews emerging technologies that may have relevance for education and training, and provides a safe online environment in which users can experiment.

Importantly, in relation to this Review of the National Innovation System, Education.au is committed to supporting innovation in teaching and learning, particularly in relation to the use of information and communication technologies (ICT).

Education.au has more than 10 years of experience in providing innovative solutions including, for example:

- The development of the first quality assured database of online teaching and learning resources using a unique education-specific Dublin Core based metadata standard
- Introducing RSS feeds for edna services
- Trialling mobile edna
- The development of an open source distributed search of multiple quality assured teaching and learning repositories
- The development of a free open source tool bar to evaluate the accessibility levels of web pages
- The development of myfuture bringing together disparate data sources to provide an integrated view of 600 occupations and earnings, 18,500 education and training courses, 220 labour market regions, scholarships, and 700+ industry profiles.
- The provision of the edna sandpit to enable trialling of a range of education-related applications such as Live Classroom and LAMS
- The development of the Carrick Exchange which uniquely combines user generated content and social networking, distributed search, OAI-PMH harvesting, groups, messaging, bookmarking, and a formal repository system

Most of these kinds of services – RSS, mobile, open source software development, social networking and so on are now considered mainstream. Education.au was trialling and implementing such services early in their hype cycle.

The education and training sector's engagement in the national innovation system is fundamental to Australia's success as an innovative nation.

It is in the education sector, from early childhood, to primary school, high school, VET, and beyond, where the values of innovation and creative thinking can be embedded in our young people who become our workers, leaders, managers and CEOs.

This requires that educational organisations and systems are themselves innovative organisations, and encourage a culture of innovation. and that the barriers to innovation within them are reduced.

## **Some observations on innovation**

Education.au would like to offer some general observations about innovation based on its experience of innovation in the delivery of ICT for education and training.

**The capacity to innovate is based on attitude and organisational culture.** Large organisations are based on systems and processes which make them efficient. Change can be expensive, disruptive and time consuming. Innovation requires change to systems and processes. If organisations are to be innovative their systems and processes need to be sufficiently flexible and agile to accommodate rapid change. Their management and staff need an attitude that is open to change, in fact, they need to embrace change as part of their daily working life.

**Innovation will have unknowns.** Innovation can be messy and chaotic and can have implications for the organisation that may not be known at the time when the decision to implement an innovation is made.

**Innovation can be unsuccessful.** The embracing of innovation as an organisational value must embrace the possibility that an innovation might be wrong, may fail, and may have costs that are not recoverable.

**Innovation can be exhausting and relentless.** Organisations need to consider and manage the human cost of relentless innovation in the workplace. Employees may well look for less innovative working environments.

**Innovation requires good underlying processes and procedures.** In order to free up time, energy and creativity for its staff to innovate, the organisation needs to have good underlying processes and procedures.

**Innovation means embracing the odd, peculiar and the out there.** This applies to both people and ideas. Some organisations employ people on the basis of whether they will fit in with the existing corporate culture. Innovation frequently requires that organisations accept and nurture the flaky weirdo with the odd ideas, and that they build a diverse staff profile to generate synergies, energy, conflict and creativity.

**Innovation requires thinking space.** The quest for productivity increases, and increased competitiveness can limit the opportunities for staff to have the time and energy to have ideas. Organisations need to provide staff with 'unproductive time' if they want to encourage innovation.

**Innovative ideas may leapfrog the current state of play rather than be a linear progression.** This can have implications for whether there is a capacity for implementation, and the amount of change and disruption the innovation could cause.

## **Challenges in embedding an innovation culture**

In our experience in education and training there are some challenges to innovation that need to be considered when constructing a national innovation system.

### **Is it a potential innovation or a fad that will go away?**

Particularly in the area of new and emerging technologies it can be difficult to assess whether a new technology solution or device is an innovative teaching tool or a fad that will fade within a couple of years. Given the costs of introducing change across entire systems, decision makers frequently take a 'wait and see' attitude. This can mean that systems and jurisdictions fall behind the mainstream because the risk of getting it wrong is seen as too great.

### **Cost**

Implementing an innovation has a cost. In relation to ICT that cost includes software, hardware, and bandwidth. Innovation may not occur if the cost of implementation is perceived to be too high and the benefits not sufficiently concrete. This can be the case in education because outcomes of a particular innovation can be hard to measure directly, and the benefit may be intangible, or it may take several years before there is any return.

### **Professional development**

The implementation of an innovation requires an ongoing commitment to professional development and training for staff, managers, and leaders – if staff are to take advantage of the innovation. That is, professional development, training and upskilling need to be built in to the innovation cycle.

### **Risk**

An organisation needs to assess where it sits on the risk continuum for innovation – is it risk averse? Is it prepared to accept risk as part and parcel of being an innovative organisation? Risk management will need to be reframed so that its emphasis is on how innovation can be embedded in an organisation, rather than what can go wrong.

## Approaches to innovation

To support innovation in education and training, Education.au has undertaken the following kinds of processes, which could be usefully considered in the development of a national innovation system.

### Acceptance and encouragement of risk taking

Risk needs to be accepted as a part of the innovation package.

Risk needs to be an accepted part of the innovation cycle – the use of rapid prototyping, proof of concept, testing, evaluation and research cycles can provide an evidence base for decision-making.

### Help in reducing risk

Provide help to organisations in assessing risk and benefit and shifting emphasis from the ‘what can go wrong’ to ‘how can it be done’. In Education.au’s paper ‘Emerging Technologies: A Framework for thinking’ developed for the ACT Department of Education and Training, a decision-making matrix was developed. This could be used by an organisation to assess whether or not an emerging technology or device was a useful innovation and what the implications of implementation would be.

The decision-making matrix included the following:

#### Teaching and Learning outcomes

- Is the technology likely to support and improve teaching and learning outcomes?
- Does it provide students with the digital literacies required to live and work in contemporary society?
- Does the technology enable existing pedagogical models to be utilised?
- Does it require new thinking about teaching and learning in order to fully utilise its potential?

#### Teacher Acceptance

- Will teachers accept and use this technology?
- What will be the requirements for, and impact on, teacher training and professional development?
- How will teachers be introduced to and given on-going professional development so as to maximize the effectiveness of this technology in the curriculum?
- What kind and levels of technical support will be provided for this technology?
- Will teachers be required to have their own device associated with this technology? If so, what part of the cost will they need to bear?

#### Student Acceptance and Parental Support

- Will students find this technology relevant to their lives and their learning?
- Does the use of this technology utilise existing skills, support skill development, and enhance skills?
- Is using this technology part of their required digital literacy in a knowledge economy?
- Are parents willing and able to support the use of this technology – both financially, if necessary, but also by providing encouragement and support to their children?

#### Leadership in use and take-up

- Will this technology be supported by principals and other educational leaders?

- Will principals and others lead by example, utilising this technology in their daily practice?
- Will staff champions of this technology be recognised and supported, and provided with the opportunity to demonstrate its best practice use to colleagues?

#### **Relevant, Available and Cost effective Content**

- Is there content already available that can be used with this technology?
- If not, can the technology be effectively implemented for teaching and learning purposes?
- Will content have to be specifically created?

#### **Sustainability, Resourcing, Risk, Extensibility**

- If we invest in this technology, is the financial investment sustainable in the long term?
- What are the resource implications for infrastructure, training, maintenance and enhancement?
- As the sector grows, can the technology grow and extend to meet new requirements?

#### **Interoperability and Integration**

- Is this technology interoperable with current technology in place – that is, is it backwards compatible?
- Can it be integrated with existing systems?
- Will it interoperate with other systems?
- Is it standards compliant to enable content and data sharing?
- Is there a need for a middleware layer between it and other applications, platforms or systems?

#### **Applicability**

- Does this technology apply right across the school and college, or is it more relevant to some sectors than others?
- What kind of technologies in particular are appropriate for early childhood?

### **A culture of innovation**

Australia, as a society, needs to accept and embrace both the risks and benefits of being an innovative nation. The culture of innovation needs to be embedded within the education and training sector as part of our lifelong learning culture. Methods and processes for harvesting innovative ideas, exploring and exploiting them, need to be embedded within organisations. Creating a culture of innovation requires open and collaborative management styles and recognition and reward for those who provide ideas.