Australian Flexible Learning Framework

supporting e-learning opportunities

The role of technology in engaging disengaged youth: final report

April 2011

Australian Government

Department of Education, Employment and Workplace Relations

flexiblelearning.net.au

Acknowledgements

This report was produced for the Australian Flexible Learning Framework (Framework) by The Foundation for Young Australians and the Inspire Foundation.

The report was written by Lucas Walsh, Barbara Lemon, Rosalyn Black, Cheryl Mangan and Philippa Collin.

The Foundation for Young Australians

21-27 Somerset Place, Melbourne

Victoria, 3000, Australia

http://www.fya.org.au

Inspire Foundation

102 Beattie Street, Balmain

New South Wales, 2041, Australia

http://www.inspire.org.au

This report should be cited as:

Walsh, L, Lemon, B, Black, R, Mangan C and Collin, P (2011) *The role of technology in engaging disengaged youth: final report*, Australian Flexible Learning Framework, Commonwealth of Australia, Canberra.

Table of contents

Executive summary

"People expect to be able to work, learn, and study whenever and wherever they want" (Johnson et al, 2011, p.3).

Background

The cohort of young people who engage in learning through the Australian vocational education and training (VET) sector is a highly diverse one. It includes young people whose successful achievement and attainment may be compromised by a wide range of circumstances including geographic remoteness, socioeconomic disadvantage, disability or being a new arrival from a non-English speaking country. These young people face a heightened risk of disengagement from learning. This in turn makes them vulnerable to a host of negative outcomes including unemployment, lower levels of income, reduced health and wellbeing and limited choices and options across the life course.

The continued emergence of new information and communication technology (ICT) represents an important opportunity to engage or re-engage these young learners. The use of ICT for personal purposes is now commonplace for almost all young people in Australia, even those young people facing considerable levels of disadvantage. The use of new technologies is also becoming more prevalent and commonplace within VET – and with good reason. Research shows that the creative and strategic use of ICT can help to engage young VET learners and improve their learning outcomes.

It also shows that the potential of ICT to do so is not being fully realised. A new research project by The Foundation for Young Australians (FYA) and the Inspire Foundation, commissioned by the Australian Flexible Learning Framework (Framework)[1], has built upon previous research to investigate how young people experience the use of ICT for learning purposes and what they, their teachers and trainers and other key players in the VET sector believe still needs to be done to maximise this usage and the many benefits it can bring.

The research project began with a detailed review of the literature and the identification of case studies of innovative practice that exemplify the innovative and effective use of technology for young people's learning.

It then brought this review to life through extensive consultation with key stakeholders across the Australian VET sector. This included an online youth forum, a national series of face-to-face forums with policymakers and practitioners from a wide range of organisations, a series of in-depth interviews with current and recent young VET learners and a final series of interviews with at-risk youth on the broader use of technology in education and training.

This report conveys the findings of the research project. It describes current trends in the use of technology for the engagement of young learners within the VET sector. It also identifies and explores some of the barriers and critical success factors in realising the potential of this technology, and concludes with a set of recommendations for future policy and practice.

Main findings

The research conducted for this project confirms that the issue of disengagement continues to affect young VET learners and to make them vulnerable to not achieving expected outcomes as a result of this disengagement. It also confirms that the pattern of ICT use by teachers and trainers within the VET sector remains highly uneven. There is an immense variability in the levels of skill, knowledge and comfort among VET

[1] The Framework is the national training system's e-learning strategy: http://flexiblelearning.net.au

practitioners in relation to ICT usage. While some practitioners are experimenting with technology or using it in confident and inventive ways to boost the engagement and achievement of young learners, many others are using it in limited or tokenistic ways that underuse its potential. This limited usage is the result of a number of factors:

- lack of exposure to effective practice and models of practice
- lack of professional learning to build the ICT skills required for its confident use
- lack of access to suitable, efficient and up-to-date equipment and applications
- professional environment that does not make the use of technology a compulsory part of teaching practice or preparation
- lack of adequate technical support and assistance.

This uneven usage by practitioners stands in strong contrast to the usage of technology by young people. While there is a strong pattern of unequal access to ICT among young learners, broad assumptions and generalisations about young people's technological access and ease of use must be avoided. Nevertheless, even those young people who are typically most at risk of disengagement from learning expect ICT to play an integral role within their daily lives. They also expect it to play an integral role in their learning. Young learners want and expect flexible and engaging learning environments that effectively use ICT.

An environment of this kind is communicative and inclusive. It features a high degree of collaborative learning, interactive content, as well as interactivity among learners and between learners and practitioners. It also connects learners to the world beyond the classroom or conventional learning settings. It pays attention to individual learner needs, values and interests and ensures that the content and mode of learning is relevant to learners' lives. It enables learners to build on their existing skills, reflect on their own learning and become self-regulated and self-directed. This kind of learning environment has been shown to have a direct and positive effect on the engagement and retention of young learners.

In too many instances, however, young VET learners experience an environment in which technology is used in limited ways. They are unable to rely upon the provision of appropriate technology by their educational organisations. They also describe a significant gap between their own digital literacy and technological proficiency and that of their teachers and trainers.

There is a clear need for strategies that can address these gaps and barriers. At the same time, technology in itself is not sufficient to ensure the engagement of young learners. Too much emphasis on technology-led approaches can take attention away from the need to provide quality learning that includes quality teaching, quality content and positive, trusting relationships between young learners and their teachers or trainers.

Many of these strategies need to be led or supported at the level of organisational leadership and policy. One of the most frequently cited obstacles to the effective and creative use of ICT for the engagement of young learners in the VET sector is the lack of endorsement and support from leadership. This may take the form of inadequate funding or resources for ICT equipment, applications or spaces. It may also take the form of organisational policies that work against the kind of learning environments required for effective ICT use. This points to an organisational or sectoral culture and climate that is out of touch with the realities of young learners' experience and preferred (and diverse) learning styles.

Recommendations

The findings of this research project indicate that certain conditions are required to realise the potential that technology represents for the engagement of young learners. These include a more flexible and responsive policy environment that allows

practitioners to tailor the use of technology to the needs of young learners, the provision of appropriate infrastructure and skills to support practitioners and young learners, and the promotion of a learner-centred pedagogy across the VET sector.

The following recommendations arise from these findings:

1. **In order to be effective in the VET sector, ICT should be used to promote a tailored and learner-centred pedagogy based upon the current use of technology by young people.** A one-size-fits-all approach will not be successful in engaging young learners, nor will the simple transfer of written content online. The multimedia and interactive functions of web 2.0 must be fully used, along with the emerging practices made possible by smart phones and mobile technology. Relevance and convenience of content is crucial for engagement. Blended delivery (eg via face-to-face and online media) is ideal.
2. **Effective implementation of ICT in the VET sector relies upon strong endorsement from organisational leaders.** In particular, rigid organisational policies and codes of conduct must be reviewed to facilitate the effective use of ICT for learning across the sector in flexible ways.
3. **Substantial investment is required to build the capacity of VET practitioners to use ICT with confidence.** Staff must have ongoing professional development to equip them with current technical skills and to support them in understanding the role of ICT in young people's everyday lives. Only practical, sustained examples that demonstrate real results will serve to convince practitioners to change and/or improve their practice. One solution might be the development of a central resource to showcase online examples of good practice (ie screencasts, digital diaries of teachers, videos of classes in action) that allow practitioners to visualise the technology at work. This could be displayed as an interactive map, allowing practitioners to find out what kinds of projects and technological innovations are underway in their local area. Staff could also benefit from personal learning plans in ICT, and from mentoring programs. Allocated and paid time for training and resource development must be considered. Rewards programs for teacher innovation may also be successful.
4. **Organisational and system VET policies cannot assume equality of access, nor can they assume uniform levels of competency in ICT.** Learning policies should be developed with input from young people and be based upon principles of diversity and flexibility, bearing in mind the caution that "*policy does not deliver practice*" (Figgis, 2009, p.15). Online training for remote youth might be considered, along with improved ICT access at community centres or learning hubs. Equipment hire systems should be considered, along with centralised IT support systems that are open 24 hours a day and 7 days a week.
5. **Further research is required and must be undertaken collaboratively with policymakers, practitioners and young people.** While Cisco[2] has already flagged the emergence of Education 3.0 as the new paradigm of 21st century learning (2007), there is still a marked lack of reliable and original research and evaluation evidence in relation to the use of social or interactive technologies in pedagogy (Anderson, 2007). Further research must build on the work of the Framework, which was launched as an e-learning strategy specifically for the VET sector and has funded hundreds of E-learning Innovations projects[3] to inform and model good practice.

[2] http://www.cisco.com/
[3] http://flexiblelearning.net.au/innovations and http://trainingo2.net/eli/search2.php

Introduction

> *"Digital literacy is a key component of engaging individuals in lifelong learning" (The Smith Family, 2008, p.2)*

The VET sector encompasses a highly diverse range of learning sites and settings that extend from formal classrooms to workplaces. It also attracts a highly diverse range of learners. This is particularly true now that the Australian Government has instigated its 'learn or earn' policy in relation to the Youth Allowance. Many of the at-risk young people who have opted out of traditional schooling are now expected to access VET courses through TAFE and other service providers. This creates a heightened need for the VET system to find ways of engaging disengaged young learners.

What do we mean by disengagement? Learners who are engaged feel that they belong in the learning environment. They have good relationships with their teachers and with other learners. They participate in learning activities and they value learning and the outcomes it can bring them (Willms, 2003). By contrast, disengaged learners may feel alienated or isolated within the learning environment. This may show itself in passivity or lowered effort, lowered achievement, disruptive behaviour, withdrawal, poor attendance or, ultimately, early leaving. Part One of this paper discusses the outcomes of this situation in greater detail. There are also descriptions of which groups of young people are characteristically at the greatest risk of disengagement from learning within the VET sector.

ICT is a broad term that includes technological devices (such as computer software and hardware), related communication practices (such as social networking, emailing, game-playing) and the relationships that develop through the use of technology (Star & Boweker, 2006). ICT also encompasses applications of technology including the internet, mobile phones, gaming, assistive technologies, digital photography, music and media production.

Research shows that these new technologies play an integral role in young people's lives in ways described in Part one. Their capacity for interactivity combined with the vast range of information available through them are constantly changing the way young people access information, learn and interact. This applies equally to young people who are marginalised and disengaged. New technologies, where available, provide these young people with access to information, social connection and social support as well as opportunities to create and publish content that matters to them (Stephens-Reicher et al, 2010). Emerging evidence from this and other recent research also suggests that the use of ICT may have a significant impact on the education and training outcomes of disengaged young learners. Integrated appropriately into a VET learning program, new technologies have the potential to:

- Support disengaged young people to develop essential 21st century digital skills, including the computer literacy skills required for success in the workforce.
- Support disengaged young people to develop employability skills as stipulated by the Australian Government, including communication, problem solving, initiative and enterprise, planning and organising, self-management, and self-directed learning (DEST, 2006).
- Connect groups of young people across learning sites nationwide in collaborative activities that build their skills and give them a feeling of shared educational success.
- Provide personalised learning programs that meet the needs of disengaged young people and can be delivered and accessed anytime and anywhere.

- Reach and engage disengaged young people in relevant learning experiences, including culturally relevant experiences.
- Provide structures, such as peer support models and practitioner-learner links, to support disengaged young people to continue their learning journey.

Affordable, high speed broadband connections are the building blocks for a new world of teaching and learning. Levels of connectivity and bandwidth are currently inconsistent across the country, but the roll-out of the Australian Government's $43 billion National Broadband Network has the capacity to greatly enhance access to resources and online training, particularly for regional and remote VET providers. As such, it represents an unprecedented opportunity for the VET sector to build a learner-centred, technologically rich pedagogical framework that improves the retention and learning outcomes of young people who are at risk of disengagement (DEEWR, 2011). Despite this powerful potential, research suggests that the sector's current application of technology for learning purposes is extremely variable. This inconsistency, its causes and its possible solutions, are discussed in detail in this paper.

Methodology

This report is the result of a research project undertaken by FYA and the Inspire Foundation, commissioned by the Framework. The research was in response to recent Australian Government initiatives designed to boost participation in education, training and employment among young people, which have resulted in increasing numbers of young people joining the VET sector, and increasing pressure on VET practitioners to keep these young people engaged.

The report builds upon the findings of existing research, policy and practice literature to illustrate the potential for more effective use of technology as a tool to engage disengaged young learners across the VET sector. It identifies and explores some of the barriers and critical success factors in realising this potential, and concludes with a set of recommendations for future policy and practice.

Research for this report was conducted in two stages. A Critical Friends Group served to ensure quality control across the research process, providing feedback on the issues paper and the final report as they were developed. The group comprised five VET practitioners and researchers from across Australia: Jane Figgis (consultant, WA); Ian Griffith (VET practitioner working with disengaged youth, QLD); Rebecca Scott (founder of STREAT, VIC); Georgina Nou (online facilitator and researcher working with Indigenous youth, SA); and Janice Atkin (Education Sector Manager for the Inspire Foundation, NSW).

Stage one: Literature review and issues paper

Stage one called for a detailed review of the literature and culminated in the production of a 10,000 word issues paper that outlined major themes, research findings, and questions for further investigation by the research project, as well as identifying case studies of innovative practice. Relevant literature was identified through a search of academic social sciences databases including:

- A+ Education
- Academic Search Premier
- Education Complete
- Education and Information Technology Digital Library (EdITLib)
- Education Research Complete
- Education Resources Information Center (ERIC)

- Expanded Academic ASAP
- JSTOR
- Web of Science.

Searches were also made of key Australian and international research and policy websites including the Framework, National Centre for Vocational Education Research (NCVER[4]) and Education Services Australia[5] sites. Google searches were undertaken to identify research that may have been commissioned or conducted by philanthropic or non-government organisations but not published in conventional sites or journals. Given the importance of recent and current contexts in this discussion, the searches focused primarily on material from 2000 through to the present. In order to ensure that relevant studies were not missed, the search terms remained broad. These included 'online', 'web 2.0', 'digital' and 'technology'; 'young' and 'disengaged'; 'vocational education and training' or 'VET'; and 'RTO' (registered training organisation).

An online youth forum was conducted to inform the issues paper and supplement the written findings. The forum was hosted by staff from the Inspire Foundation and FYA on the ReachOut.com website in October 2010. The session was advertised on the ReachOut site a week ahead of time. It ran for two hours, attracting 86 posts from self-selected participants who were browsing the ReachOut forums page. Discussion centred upon the way in which young people currently use technology for both personal and educational purposes, how they have seen technology used in education, and how they might like to see it used to improve their learning.

Stage two: National forums

Stage two of the research project included a series of national forums – one in every state and territory – which brought together policymakers and practitioners from a wide range of public, private and not-for-profit organisations connected with the VET sector. The forums were advertised via Framework E-learning Coordinators in each state and territory and via e-newsletters from FYA and the Framework. They were held over the course of February and March 2011:

State	Date	Location
NSW	3 February 2011	Darlinghurst, Sydney
NT	10 February 2011	Online
VIC	11 February 2011	South Melbourne
WA	15 February 2011	West Perth
SA	17 February 2011	Hindmarsh, Adelaide
ACT	23 February 2011	Online
TAS	28 February 2011	Online
QLD	9 March 2011	South Brisbane

To ensure the presence of a representative youth voice at these forums, a series of in-depth interviews were also held with current and recent VET learners across a range of subject areas, some of whom have completed their studies and some of whom have not. Comments and quotes from these youth interviews were presented to forum attendees before discussion commenced. Following an introduction by the

[4] http://wwwncver.edu.au
[5] http://esa.edu.au

Framework, the forums were facilitated by researchers from FYA. Small and large group discussion centred around four groups of questions:

1. How is technology currently being used to engage learners in VET? How are you using technology? What's working? What's not working?
2. What are the particular barriers you face?
3. How would you like to see technology used to engage the disengaged? What can you imagine?
4. What can we do about it? What do we need?

Feedback from each of the national forums was analysed thematically and incorporated into this final report.

Following the forums, a further eight interviews were conducted with at-risk youth in Melbourne on the broader use of technology in education and training. These interviews were filmed by the St Kilda Youth Service and compiled to make a short video that will assist with the eventual dissemination of the research findings.

Part one: Overview of the issues

Part one of this paper sets the scene for the findings of the research project by considering the issues and contexts which the project has been designed to address. It discusses the issue of disengagement as it affects young VET learners. It describes which groups of young people are characteristically at the greatest risk of disengagement from learning within the VET sector and some of the suboptimal outcomes that result from this disengagement.

It also considers the existing trends and patterns of ICT use by teachers and trainers across the VET sector, drawing both on recent surveys of the sector and on the experience and anecdotes of the practitioners who participated in this project's forums and consultations.

It then contrasts these trends and patterns with the use of ICT by young people, including young people who belong to the groups that are characteristically most at risk of disengagement from learning. It examines the ways in which ICT has become an integral part of young people's daily lives and an important aspect of what they need and expect from their learning environments and experiences.

Educational engagement and technology

> *"We're a generation that has grown up with technology… the reason why I wanted to drop out [of my TAFE business studies course] was because it wasn't very efficient, it wasn't a good use of time. And with the practical work, I was basically doing filing eight hours a day for $200 a week. The main reason I was doing it was because society says we have to have a piece of paper." (learner interview, 2011).*

A vast amount of literature has been dedicated to the issue and challenge of educational disengagement. The literature has not been reproduced here. Instead, it has been drawn on to identify two distinct understandings or definitions of disengagement that are used to describe the learning experience of young people:

1. Disengagement as lack of participation or enrolment in education and training.
2. Disengagement as withdrawal or suboptimal involvement in education and training.

While each of these definitions has important implications for the ability of the Australian VET system to engage young people in learning, this research relates

primarily to the second definition. This paper is less concerned with the challenge of attracting young people to the VET sector than with the challenge of creating the kind of learning environment and experience that keeps young learners engaged once they are enrolled (ie retaining learners).

The cohort of young people who engage in VET study is a highly diverse one, varying both in age and in educational background. It encompasses young people still at school who are engaged in VET in Schools programs; Year 12 completers who are engaged in apprenticeships, traineeships and other VET programs; and early school leavers. This last category has been shown to comprise young people who are most likely to be at risk of ongoing educational disengagement. It includes disproportionate numbers of young people from non-metropolitan, Indigenous or low socioeconomic status (SES) backgrounds and settings. These young people are likely to face the interrelated challenges of low levels of literacy and numeracy, disability, homelessness or being a new arrival from a non-English speaking country (Volkoff et al, 2006).

The most recent *How Young People are Faring* report (Robinson et al, 2010) reveals that 16% of teenagers in Australia are not in full time work or study. VET was found to be an extremely important pathway for these young people. This reinforces earlier findings that vocational qualifications are an important means of gaining post-school awards for young people from disadvantaged backgrounds and for young adults living in rural areas: for almost one third of the latter group, a vocational certificate was their highest post-school qualification in 2009 (Robinson & Lamb, 2009).

The benefits of remaining engaged in VET and completing a qualification are clear. Young people who completed an apprenticeship or traineeship in 2010 were earning an average of $45,900 to $52,500 nine months later, compared to an average of $40,700 for those who did not complete a similar qualification. The rate of employment for VET completers was also almost 20% higher (NCVER, 2010). This is particularly important in the face of long-term declines in employment rates for teens and young adults (FYA, 2010). In terms of wellbeing, a 2009 survey revealed that 41% of apprentices were very happy with their work, at least six percentage points higher than any other group of young people (including tertiary-educated young people) and 30 percentage points higher than young people who were unemployed (FYA, 2009).

The effective use of ICT is a recognised feature of the kind of learning environment that best engages young people, including the groups of young people described above (Stephens-Reicher et al, 2010). This is because it has the potential to cultivate what The Smith Family has called ‘a learner mentality’: that is, the confidence and interest to engage or reengage with education (2008, p.4). In more specific terms, it can encourage the engagement of young learners who prefer to work collaboratively, who prefer not to have to perform or ask questions in front of their peers, or who respond well to the use of alternate learning media (such as video for visual learners). It can also encourage young learners to continue and extend the learning discussion and exchange of ideas outside formal learning hours and contexts as well as to extend their learning beyond the formal curriculum by pursuing topics that interest them. Lastly, it can enable young learners to publish their work online for a peer or wider audience. This encourages a greater sense of ownership and engagement in the learning process (Education Services Australia, 2009c).

The use of ICT also enables young learners to take an active and confident role in a changing social climate. Some of the features or principles of effective ICT use in a learning environment are summed up in what Cisco has termed ‘21st century pedagogy’ (2007, p.9). This describes a pedagogy that is learner-centric, encourages collaboration, uses authentic learning contexts and activities, and is strongly associated with higher levels of learner participation and engagement. Stephen Heppell has summarised the differences between 20th and 21st century characteristics and values (no date):

20th century	21st century
Conforming	Ingenious
Stable	Agile
Quality controlled	Quality assured
Subject based	Project based
Delivered wisdom	User generated content
One size fits all	Personalisation
Individualised	Community/collaborative
National	Global
One to many	Peer-to-peer
Interactive	Participative
Curriculum centred	Learner centred
Retaining	Critiquing
Teaching	Learning

There is an overwhelming consensus that technological proficiency is an essential skill for young people growing up in the changing world that Hepple's table describes. In this world, as one report notes, "*accessing and selecting information sources, discerning authorship, and assembling and communicating knowledge with digital technologies will assume critical importance for personal, academic and workplace success*" (Kimber & Wyatt-Smith, 2010, p.607).

The evidence is, however, that pedagogical practice in VET settings rarely conforms to these principles. Brennan's conclusion in 2003 was that "*the new technologies certainly have the potential to generate new processes for teaching and learning but few of the possibilities have... been recognised*" (p.8). While the number of VET enrolments incorporating e-learning in some form has since risen from 3% to 43% (Australian Flexible Learning Framework, 2010a), Brennan's observation remains pertinent. The full potential of technology as a tool for engagement has not been realised in all learning settings. This raises a number of challenges for future practice within the Australian VET sector.

Current use of technology in the sector

One of the great challenges for the VET sector is the way in which the current use of technology for learning varies, both between individual practitioners and between organisations. What emerges overall, however, is a pattern of usage that is lower than should be the case.

This is illustrated with particular clarity by the emerging findings of a study commissioned by the Framework. Conducted annually by the Framework, the national E-learning Benchmarking Student Survey[6] provides the most current snapshot of e-learning around the country. The survey measures student attitudes towards the uptake, use and impact of e-learning, with questions around the extent technology is being used in training, the types of technologies being used and the impact of e-learning on educational quality The findings from the 2011 student survey are being finalised at time of writing this report, but provide valuable insights into patterns and perceptions of ICT use for learning within the sector.

[6] http://flexiblelearning.net.au/e-learningindicators

These findings include the observation that a large majority of VET learners are gaining some exposure to e-learning technologies through their courses, whether this be through their access to learning resources and content, their learning activities or their assessment. Eighty-three percent of learners who responded to the student survey in 2009[7] indicated that they experienced some degree of e-learning in their course. At first glance, a comparison of this year's findings with those of recent years is encouraging. The proportion of learners who experience a lot of e-learning has increased over the past few years. This is offset, however, by a similar increase in the proportion of learners who experience none. This suggests that the spectrum of practice is becoming more polarised: some VET courses are placing more of an emphasis on the use of ICT while others are placing less.

Most of the practitioners who attended this research project's national forums are using, or are familiar with, some kind of online learning management system (LMS), whether it be Blackboard[8], Moodle[9], Janison[10], Umbraco[11], Sakai[12] or My.TAFE[13]. Despite this common familiarity, there is a great variability of practice. Where some practitioners make the most of this organisational software by uploading video material, quizzes, games and sound files, others take a minimal approach, simply uploading text-based documents and course outlines to replicate existing paper-based approaches online.

Practitioners also report quite different approaches to the use of other ICT platforms. Some regularly use virtual classroom or online conference tools such as Elluminate[14], Adobe Connect[15] and Adobe Captivate[16], where others see an online connection like this as something that is beyond their reach and to which they can only aspire: "*I would like to use Skype to beam in international speakers to my classroom, but that's a fantasy in my organisation.*" (participant, national forums, 2011).

VET practitioners testify that learners respond well to instant feedback from their teachers: enabling easy contact between learners and teachers has been found to help learners stay engaged. The challenge for practitioners is having access to technologies that genuinely support this kind of interaction. For example, participants in the national forums identify wikis as useful tools but also as tools that have the drawback of not being able to track learner progress or keep learner work private. Blogs are widely recommended as a means of keeping learners connected with and accountable for their learning while improving their literacy skills, but are only used by a minority of practitioners. Some practitioners use Facebook[17] or MySpace[18] to instigate class discussions, but organisational firewalls present a major access problem and discussion often has to be mediated from the practitioner's home computer. In addition, frequent interaction between learners and teachers can be

[7] http://e-learningindicators.flexiblelearning.net.au/docs/09results/2009StudentResultsStateTerritoryProviderType.pdf
[8] http://www.blackboard.com/
[9] http://moodle.com.au/
[10] http://www.janison.com.au/JP/panels.aspx?Id=Home
[11] http://umbraco.com/
[12] http://sakaiproject.org/
[13] http://my.tafe.qld.gov.au/tqaccess/logon.aspx
[14] http://www.elluminate.com/
[15] http://www.adobe.com/products/adobeconnect.html
[16] http://www.adobe.com/products/captivate/
[17] http://www.facebook.com/
[18] http://www.myspace.com/

time-consuming. Only one practitioner described the use of Book Me[19] or Flash Meeting[20] software to manage this.

A growing number of VET practitioners are turning to the visual and interactive elements of ICT to assist with learner engagement. Some use virtual worlds where learners create avatars and take part in role-play. Examples include learners mediating a conflict situation in a virtual pub, or attending a virtual court case. Other examples include a driving course which was set up for remote learners unfamiliar with traffic lights and zebra crossings, allowing them to experience this kind of driving virtually. Practitioners also report high success rates using game-based learning, even with simple crosswords or competitive quizzes set up like popular game shows.

Video and digital storytelling is noted for its versatility in coursework, and seen as an ideal medium for the transfer of information, but it is rarely used. One practitioner has found that an iPod Touch enables her learners to access mobile applications (apps) to make short films complete with title slides and music, while preventing them from being distracted by phone calls and messages. The portability of the device also enables learners to improve their literacy skills in engaging ways outside the learning setting. One group of learners used their iPods to take photographs of road signs and put the images together to form sentences or stories. More advanced learners have made their own films or photo stories to take home. Another practitioner encourages his international learners to make short digital stories about their countries of origin as an icebreaker in their English as a Second Language class. He notes that language learners in his organisation can first record themselves speaking and then upload podcasts to the Moodle LMS, allowing their teachers to advise them on their pronunciation.

A few practitioners report successful use of Point of View (POV) glasses – streamlined goggles or glasses fitted with a camera – as a more flexible mode of assessment. Learners can film themselves undertaking a welding task, for example. This film can then be offered as evidence of their competency in place of the more traditional written report. One instructor working specifically with Indigenous male plumbing apprentices with low literacy has chosen to film his learners responding to interview questions rather than setting them a written exam. All recorded work is then stored in an e-portfolio[21] for the reference of future employers.

A very small number of practitioners report using smart phone apps in their classes. These apps can offer learners ready access to information: an app for hospitality learners, for example, provides basic recipes on demand for stock or poultry stuffing. In the Northern Territory, a ‘Fliplett’ has been purpose-built for kitchen operations learners and is publicly available. This online textbook is interactive, with an icon or animated character guiding learners through a series of activities.

Young people and technology

This patchy usage of ICT by practitioners stands in contrast to the strong presence of technology in the lives of many young learners. ICT is a way of life for most Australian young people. It is central to the way in which they learn, relate and make meaning in their everyday lives (Wyn et al, 2005). The prevalence of social networking in particular, together with the inherently interactive characteristics of the online environment, have changed the way that young people communicate with their peers, their families and other adults (Collin & Burns, 2009). In 2009, 90% of young people of high school age (12 to 17) and 97% of young people aged 16 to 17 were regularly using social networking sites. Young people aged 12 to 17 used the internet for an average of 6.3 days a week at an average rate of 2.9 hours a day while young people

[19] http://www.bookme.com/
[20] http://flashmeeting.e2bn.net/
[21] http://www.flexiblelearning.net.au/content/e-portfolios-4

aged 16 to 17 used it for an average of 6.7 days a week for an average of 3.5 hours a day. This includes internet use both at home and at school. It is unsurprising, therefore, that 91% of school-aged young people in Australia describe the internet as a 'somewhat', 'very' or 'extremely' important aspect of their lives (Australian Communications & Media Authority, 2009a).

If anything, this centrality is growing. A recent extensive study of young Americans shows that their use of ICT has escalated markedly over the past five years and continues to grow (Rideout et al, 2010). There is no reason to assume that the pattern for young Australians is any different. Early results from the Framework's 2011 E-learning Benchmarking Student Survey shows that VET students make a high degree of personal use of technologies such as computers, mobile phones, MP3 players or iPods and Facebook or MySpace. It also shows that personal use of online technologies is almost ubiquitous[22]. This technological use is also subject to change and evolution. Recent studies predict that by 2015, 80% of people accessing the internet will be doing so from mobile devices and that Internet capable mobile devices will outnumber computers within the next year (Johnson et al, 2011).

The character of young people's online engagement has already undergone a significant shift over the past decade. This has been driven primarily by the growth of what has been called web 2.0, which can be defined broadly as "*a more socially connected web in which people can contribute as much as they can consume*" (Anderson, 2007, p.4). Coined in 2004, web 2.0 emphasises the importance of active participation by users in generating and sharing content. Wiki tools, for example, are designed for collaborative forms of web publishing. They enable documents to be written, revised and expanded collaboratively by users.

In a similar way, blogging enables users to engage in processes of knowledge construction that are more informal and personal than with traditional educational content. By enabling users (both students and practitioners) to develop, repurpose and customise their online educational resources and environments, these resources and platforms present opportunities for learning collaborations, knowledge construction, and the creation of learning content that is relevant and culturally appropriate. While young people in the 1990s used the internet primarily for entertainment purposes (Valkenburg & Soeters, 2001), the advent of web 2.0 platforms has seen its use for interpersonal communication and the production of user-generated content (Third & Richardson, 2009).

As a result, the internet has become more than just an information portal for young people. It has become a space in which relationships can be initiated and developed (Boase et al, 2006). It is also a space in which young people may produce their own content, use and comment on existing content, design personal websites and launch online enterprises (Shao, 2008; Montgomery et al, 2004). As a result, young users of ICT are being transformed from passive consumers into producers and sharers of content.

These findings are borne out by the responses of participants in the online youth forum. These young people indicate that they use technology primarily to enhance their connection with others: family, friends or people with shared interests. They also use it to create and share content by blogging or posting creative writing and multimedia. In so doing, they are combining processes of individual creativity and identity development with socialising and building relationships. They are also engaging in a process of exploration, problem solving and self-discovery guided by their personal goals and interests.

In this context, ICT provides opportunities for more interactive, peer-based and self-directed learning experiences. This is what many young people expect. As learners, young people want to be able to determine how, when and where they learn. They

[22] Ian Phillips pers comm, 2011

learn better in environments and through activities that are highly interactive and connected to applied external contexts, some of which may be directly linked to their own lives: work, education, entertainment or the logistics of everyday living (Mossuto, 2009; Prensky, 2005). They seek instant feedback and instant availability of information, and can be frustrated by traditional modes of instruction. Some young learners, as we have already indicated, also value the interactivity and anonymity that ICT can offer them, especially in contexts where they may be may be 'teacher-shy' (participant, national forums, 2011) or afraid to appear ignorant:

> *"Facebook we couldn't actually access at TAFE, it was more for when we were at home, but there was a group for the Graphic Design learners. I'm pretty sure it was one of our teachers who modelled it. It wasn't used that often but it was there. One of the girls in our class made a group for our class so we could all get together if we got confused about an assignment or we wanted feedback about some of our work. That got used a fair bit." (learner interview, 2011).*

This young learner's comment reflects a widespread preference among many young people to discuss their coursework with their peers in a private environment, without fear of judgement, but comments from the national forums indicate that young people do seek interaction with their teachers or trainers too. Online mentoring programs, virtual classrooms and demonstration videos, for example, have been used with great success. Young people who took part in the online forum point out that they are more than willing to help their instructors by demonstrating the sorts of technologies they like to use and would even welcome the opportunity to develop software or build applications for their classes as part of their assessment.

This potential for the creative use of apps to assist with coursework is significant because most young people have access to a mobile phone, with smart phones rapidly becoming ubiquitous. This emerges even within quite disadvantaged contexts. Practitioners working in the Northern Territory, for example, note that many young people living in town camps with no fixed address and no home internet access are nonetheless in possession of smart phones. The same observation is made by practitioners in New South Wales. It must be remembered, however, that practitioners do not necessarily use mobile technology to the degree that their learners do. The young people interviewed for this research describe a major gap between the ways in which they use technology in their everyday lives and the ways in which their teachers and trainers do.

Summary

ICT increasingly plays a central role in the lives of many young people in the 21st century, including those experiencing disadvantage. It also plays an increasingly central role in the learning process. ICT is ideally placed to facilitate the kind of learner-centric, collaborative, authentic learning that can keep young people engaged. This is because young people learn better in environments and through activities that are highly interactive and connected to the real world. They respond well to the instant feedback from their teachers and trainers that ICT can enable. In addition, the immediate availability of information is engaging to young learners. There is, however, an immense variability in the levels of skill, knowledge and comfort among VET practitioners in relation to ICT usage.

Part two: Practice and potential

Part two of this paper builds upon the discussion in Part one by considering the ways in which ICT can be used to engage disengaged young people. It begins by considering the kind of learning environment which young people find most engaging and explores the ways in which technology can facilitate the creation of these environments within VET sector organisations.

It then goes on to critically examine some of the barriers to the effective use of technology for this purpose. It investigates the challenges of ICT access and under-developed digital literacy and the overall impact of restricted or insufficient technological access and competency on young learners and practitioners. At the same time, it considers the importance of differentiating between effective ICT use and ICT use for its own sake. It discusses what is needed to improve the technological skills of VET practitioners so that they become universally confident in the creative use of ICT to engage young learners and improve learning outcomes. Lastly, it considers the importance of leadership and organisational policy in facilitating the more effective and widespread use of ICT to engage disengaged young learners.

Learner-centred teaching and learning

It is frequently observed that effective learning is dependent on a strong connection between the learning curriculum and the real world. It is also widely recognised that "*learning is most effective when it is active, involves working on real tasks in collaboration with others – in both virtual and physical settings*" (Education Services Australia, 2009a, p.2). Creating a connection between learning and young people's lives has been shown to be instrumental to educational engagement. This is recognised by key Australian policy statements. In 2008, for example, the then Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) observed that:

> *"Learners communicate and acquire information both within and outside their formal learning programs. Connecting more closely with communities enriches learning and reduces the effects of disaffection and remoteness." (p.9).*

Seminal studies have described the features of an engaging learning environment that effectively uses ICT. An environment of this kind features a high degree of interactivity among learners and between learners and practitioners. It also helps to connect young learners to the world beyond the classroom or learning setting (Brennan et al, 2001). It features practitioners who are "*imaginative, flexible, technologically gymnastic, committed, responsible and expert communicators*" (Brennan, 2003, p.5). It offers applied and hands-on learning experiences, pays attention to individual needs, values and interests and ensures that the content and mode of learning is relevant to young people's lives (Volkoff et al, 2006).

It also enables young people to build on their existing skills, reflect on their own learning and become self-regulated, self-directed learners. Studies such as the one conducted by Kimber and Wyatt-Smith suggest that the whole notion of engagement is now "*synonymous with interest-driven, often self-directed, informal learning*" (2010, p.609). This is not just empty rhetoric: a learner-centred personalised approach has been shown to have a direct and positive effect on learner retention (Office for Education Policy and Innovation, 2007).

Web 2.0 applications can foster learner-centred environments by providing the tools for the active authoring of content by young learners in ways that are more engaging than traditional models of learning, often characterised by a one-way transmission of knowledge or fixed course content from practitioner to learner. The attractiveness of

active, learner-centred approaches is illustrated by one participant in the online youth forum:

> *"I love technology and I like the discussion on how we can better use technology to educate people… but what I do dislike is online curriculums that just require learners to sit down and do an online program as homework because they're usually very un-engaging and just boring at the best of times." (participant, online youth forum, 2010).*

Other young participants describe the usefulness of purpose-built platforms such as Blackboard and Lectopia[23] for activities such as downloading lectures or taking part in online discussion groups. Many young people find multimedia (a combination of video, audio, graphics and/or written text) particularly engaging and informative. Web 2.0 tools, applications and platforms enable the greater interactivity that young learners want and the opportunity for them to customise their own learning content. Web 2.0 applications enable learning to be tailored to individual needs; particularly the learning styles of disengaged young learners because they enable opportunities for learners with low self-esteem to develop expertise and to feel more confident and capable in the learning environment (Curriculum Corporation, 2009; Freebody et al, 2008; Duncan-Howell & Lee, 2007).

A number of Framework-funded projects work on the basis of these observations. The Community Engagement Project[24], for example, developed e-learning resources for learners who were socially marginalised and had low literacy and language levels. Community-based research and digital storytelling were an integral part of the project (Australian Flexible Learning Framework, 2010b). A further example can be found in the Not School program.

Case study: The Not School alternative education program is designed for learners not taking up traditional schooling or home schooling. It aims to rekindle the desire to learn in a non-threatening educational environment. The program operates primarily in areas of high social deprivation and is endorsed by the Department for Children, Schools and Families. A series of private partners provide infrastructure and curriculum content including the BBC, World Wildlife Fund and Science Museum. Learners are referred to as 'researchers' and attend an induction with their parents before commencing the program. Mentors (qualified practitioners) and virtual 'buddies' (previous beneficiaries of the program) are allocated to each researcher, and an individual learning plan is drawn up. Targets are set and reviewed every six weeks and researchers are encouraged to work toward a formal qualification. As part of the program, participants create multimedia projects, conduct research online, establish virtual communities and become competent users of ICT (Not School, 2009).

A number of observations made during the consultations should be factored into the design of online and/or blended delivery. One key challenge for online learning programs is maintaining a sense of learner community. Structured programs like Not School with embedded mentoring and coaching may find this to be less of a problem, but many distance learners feel isolated from fellow learners and can suffer from the effects of reduced socialisation. The development of personal skills is as important as

[23] http://www.lectopia.com.au/

[24] The Community Engagement Project worked to foster and embed e-learning within some of Australia's most disadvantaged communities and strengthen the foundation of workforce skills. The project aimed to support economic and regional development and sustainability by creating close partnerships within training organisations and adult and community education (ACE) providers. The project was funded in 2007 and built on the previous E-learning for Creative Community Partnerships Project which was funded in 2005-2006.

the development of practical skills, and online program designers must be aware of this. Another challenge involves finding the right balance of flexibility and structure. While flexibility is a selling point for online learning programs, many learners require a structured environment with regular communication from teaching staff. Furthermore, online resources must be of sufficiently high quality to keep learners engaged, with technical and teaching support readily available (national forums, 2011).

An obvious approach for the VET sector is to build on the multiple ways in which young people are already using ICT for their own purposes. This is not to say that all practitioners should set up a Facebook page, for example – learner interviews indicated that this can be too personally intrusive – but rather that they can examine what it is about a popular site like Facebook that makes it appealing to young learners and which of its ingredients (such as instant feedback, networking, ability to share images and video) can be drawn upon for educational purposes. The online platform Ning[25], for example, provides a Facebook-like experience in a closed network and is now being used by many educational organisations.

A number of practitioners have already tapped into the popularity of YouTube[26], encouraging learners to film and upload clips as part of their course assessment. In the United States, the enormously successful Khan Academy[27] began by uploading guided lessons in mathematics, science, economics and history to YouTube, and now provides a comprehensive library of free clips online. This allows learners to listen (and re-listen) to clearly-presented lessons in their own time, then complete assignments with fellow learners in the classroom or learning environment – flipping the traditional model of schooling which calls for a lecture or seminar style in the classroom and assignments that are completed at home without peer or teacher support. In the Australian VET sector, however, and particularly in public TAFE organisations, organisation-wide firewalls routinely block access to sites like YouTube, making these resources unavailable for use in the learning context.

There is no fail-safe method in e-learning, of course, and the ideal model according to the practitioners who attended the national forums is one of blended delivery. This would allow for the presentation of course content in visual, text-based or kinaesthetic form, allowing learners to learn in the way that best suits them. The use of technology to create digital narratives has been shown to create an environment that draws on learners' experiences and existing skills, that engages them and that gives them a voice in the learning environment (Lovell & Baker, 2009). Research suggests that the most effective learning for specific groups such as Indigenous young people is enabled by learner-centred and culturally appropriate approaches rather than using the technologies to distribute generic or predefined services and resources (Young et al, 2005). Targeted research with Indigenous youth in remote communities found that their participation as mediators or facilitators in meaningful community projects using digital technology "*positively affirm[s] their contemporary Indigenous identity as well as their 'belongingness' to globalised youth culture*" (Kral, 2010, p. 14).

Case study: The Recollectors NSW E-learning Innovations project is based upon the premise that storytelling is intrinsic to Indigenous culture. It recognises that a need to build storytelling skills among young people has been identified within certain Indigenous communities. The project uses digital storytelling to re-engage Indigenous young people who are disengaged from traditional classroom-based learning, and maps learning to screenwriting and media production units from the *Certificate III in Media.* (Australian Flexible Learning Framework, 2010b)

[25] http://www.ning.com/
[26] http://www.youtube.com/
[27] http://www.khanacademy.org/

KEY MESSAGES:

- *ICT allows for participatory educational experiences that use content designed to reflect and accommodate learners' interests.*
- *The optimum arrangement is one in which young learners feel part of an inclusive learning environment while feeling connected to a wider social environment.*

Learning collaboratively

As an extension to this focus on the learner, there is a consensus within the research that ICT can facilitate collaborative learning and communities of practice. This recognises that "*ICTs involve interactivity between people*" (Wyn et al, 2005, p.15). It also recognises, as we have already observed, that young people as a group expect this kind of interactivity. What has been called the Net Generation is, above all, "*experiential, engaged, and constantly connected, with a strong need for immediacy*" (Ramaley & Zia, 2005, p.8.7).

Peer-based learning is already a key characteristic of the way in which young people direct their own learning outside formal learning environments: what is needed is a mechanism that brings this behaviour into the formal learning context. Web 2.0 technologies and e-learning 2.0 tools are particularly well designed to enable collaborative learning approaches (Education Services Australia, 2009b). Applications such as wikis enable young learners to share and publish material in collaborative ways for a wide audience. Blogging tools enable them to construct and share knowledge in ways that are informal and personal (Walsh, 2009). These technologies create an atmosphere of reciprocity, where young learners feel they can both produce and evaluate knowledge and culture (Ito et al, 2008). They also provide access to virtual or online communities, which some commentators have suggested may be more important than the physical educational environment of the institute or school (Education Services Australia, 2009b). One participant in the online youth forum noted the benefits of this arrangement:

> *"My educators have set up 'mentor groups' where they dedicate an hour each week for each mentor group to meet each other in a virtual space and check in about things. Study related, exams, stress, assessments and personal issues are all able to be spoken about. It is not a requirement for educators to do this, however my educators think it adds an extra level to the study experience. It is not something I've ever experienced in my years of study, so it is a welcome change and allows for learners to connect as well." (participant, online youth forum, 2010).*

Case study: A program at Sylvania High School in Sydney is conducted by Macquarie University's ICT Innovation Centre and funded by the New South Wales Department of Education and Training. Still in beta version, the program is built around the virtual world of 'Trinity' which is loosely based upon images of the Sylvania school grounds. Using avatars, learners can design and construct buildings in Trinity and establish businesses. They can also communicate with other schools. In the school's trade training centre, they can use their Trinity designs to build real models. The program is already resulting in greater learner engagement and staff members are showing a growing interest in incorporating it into other subjects (Brown, 2010 pers comm).

Web 2.0 technologies permit a more open-ended learning environment characterised by authentic and reflective learning tasks, portable and readily available learning tools and a collaborative and networked learning culture. The learning products of such an environment are reflected in assessment (Education Services Australia, 2009c). In parts of Victoria, a new inclusive assessment model for informal learning is currently being piloted under the auspices of the Framework. The model allows learners to set up an e-portfolio in which they can exhibit their learning activity via Facebook,

Twitter[28], mobile phones, blogs, wikis and other tools (Australian Flexible Learning Framework, 2010b). Practitioners in the national forums suggest a standardised format for e-portfolios that would allow them to be transferable across all industries and between schools, TAFE organisations and other VET providers.

The Linking Latitudes program, established by Melville Island's Pularumpi School and Tasmania's Sacred Heart School, provides one example of this interactive and collaborative learning at work. Learners from both schools communicate via Skype or an instant messenger service to share information about one another's cultures and to make videos and podcasts collaboratively. Using the social networking environment, young people from the two schools interact with learners from more than 40 other schools from their jurisdictions (DEECD, 2010). In the workforce, young Australian employees have embraced mobile technology learning tools with equal enthusiasm (Ragus, 2004). In Queensland, the Framework's YMIS Mobile Touch E-learning Innovations 2010 project[29] trialled and documented the use of QR codes[30], SMS[31] and CSS[32] for mobiles and smart phones with a group of learners and trainers to test the compatibility of specific learning management sites (Australian Flexible Learning Framework, 2010b).

As an adjunct to this kind of collaborative learning among learners, VET practitioners at the national forums have called for greater collaboration between staff. This, for example, could take the form of mentoring programs, modelling good teaching practice as well as sharing templates for online learning. One practitioner has proposed the creation of a global online register of experts, so that "*if Joe in Sydney or London is an expert in engineering, he can register himself on this global network and can then be available to assist a learner in Adelaide*". Another recommended her organisation's practice of holding regular meetings for teaching staff to swap ideas and experiences:

> *"A lot of people don't have time to do [ICT training] courses, and the courses aren't always helpful. Sharing what people are doing on the ground has been really good. There have been older people who are really daunted in those meetings, but that peer support on a more informal level is a great way to go." (participant, national forums, 2011).*

KEY MESSAGES:

- *ICT can create an atmosphere of reciprocity, allowing young learners to share content and participate in group discussion.*
- *Learners benefit from online learning management systems, virtual classrooms, online conferencing facilities and online mentoring programs.*

Ensuring access and competency

Amid the evident promise and potential of ICT for learning, the growth in young people's technological capacity has been accompanied by a concern about the digital divide. Many young people in Australia do not have access either to adequate learning resources or to appropriate training to assist them in using technology effectively (Misko et al, 2004). The implications of this inequitable access are summed up by this observation: "*in the age of the information economy, modems – not mountains – separate the population*" (Manktelow, 2001, in The Smith Family, 2008, p.4).

Unequal access to ICT will reproduce and exacerbate existing patterns of disadvantage and inequity among young people. As Wyn and her colleagues note, "*existing material*

[28] http://twitter.com/
[29] http://trainingo2.net/eli/teamprofile2010.php?pid=10164
[30] http://en.wikipedia.org/wiki/QR_code
[31] http://en.wikipedia.org/wiki/Sms
[32] http://en.wikipedia.org/wiki/CSS

and economic inequalities tend to determine who has access to information technologies and who does not" (2005, p.5). This is the case for many Indigenous young people: the proportion of Indigenous school learners who attain the proficient standard for digital literacy is consistently lower than their non-Indigenous peers (MCEETYA, 2005). It is also the case for young learners living in remote locations, who show lower levels of ICT proficiency than their peers (MCEETYA, 2005).

While most regional libraries offer limited internet access and some rural communities continue to run Commonwealth-funded Rural Transaction Centres, others – particularly in the Northern Territory – are less well equipped. It is further the case for young people from low SES backgrounds, who tend to use the internet significantly less often and for shorter periods than their more affluent counterparts. This reflects the fact that households with a lower socioeconomic profile are less likely to have internet access (ABS, 2007) and that the online usage of these households is significantly below the national average (The Smith Family, 2008). Practitioners in the national forums have also drawn attention to other specific groups with limited access to technology such as young people from refugee backgrounds and young people in juvenile justice centres (national forums, 2011).

Research shows that those young people who most effectively use technology for learning have good access, ample time and autonomy to experiment and explore as well as a network of peers who support their new media interests (Ito et al, 2008). Preliminary findings suggest more than 70% of respondents to the 2011 E-learning Benchmarking Student Survey agree that their training organisation provides them with easy access to ICT,[33] yet access is raised as a major issue by participants in this research project's youth online forum. Many of these young people comment that they are unable to rely upon the provision of appropriate technology by their educational organisation. These comments are strongly echoed by participants in the national forums, who describe a range of barriers to young learners' effective use and access to ICT that include limited or poor quality facilities, over-booked computer rooms, outdated hardware and software, restrictions on bandwidth and inadequate technical support. A number of these participants have called for the standard provision of ICT equipment across all VET organisations accompanied by standard support and protocols. Several also advocate for a well-resourced ICT equipment hiring scheme for young learners. This recognises that while ready access to quality equipment enables young people to realise the full potential of ICT in their learning and development, the cost of personal ownership and access is prohibitive for many VET learners.

Case study: A program has been modelled with TAFE students in the remote Anangu Pitjantjatjara Yankunytjatjara (APY) Lands of northwest South Australia, where a combination of personal or cultural commitments, staff changes and a lack of resources was found to be severely hampering students' learning. The local TAFE set up a Moodle LMS for students training in music, interpreting and business studies and, following this, designed the 'Anangu Online' virtual community. Here – in virtual shops, schools, parks and police stations – learners can use their avatars to take part in role plays and practice their skills (Australian Flexible Learning Framework, 2008). Georgina Nou, online facilitator at APY Lands TAFE, has found that her Indigenous learners work far better with audio and visual materials than with written text and have adapted very quickly to the program. She found similar success using audio-visual materials as part of the 'dEadly mOb' project in 2006, working with 200 disengaged young Indigenous people to produce photo-stories and the Deadly Soundscapes project, in which disengaged Indigenous learners from Anzac Hill High School, Alice Springs, collaborated to write and record songs in conjunction with the Central Australian Aboriginal Media Association (Nou, 2010, pers comm).

[33] Ian Phillips, pers comm, 2011

All of this strongly suggests the need to avoid assumptions and generalisations about young people's technological access and ease of use. As Ramaley and Zia note, "*not everyone is a member of the Net Generation - not because of age but because of access to technology*" (2005, p.8.2). It also suggests that technological advances and the greater levels of freedom and autonomy they have created for young people have not permeated through to all learning settings. A paper by the Australian Government recommends that all contemporary learning spaces accommodate and reflect best practice design for learning, encourage innovation and "*adapt to possibilities beyond today's horizon*" (MCEETYA, 2008, p.10). The same paper describes the kind of digital devices and systems that are considered to be intrinsic to an ICT-rich and engaging learning space. They include:

- desktop PCs
- tablet PCs
- ultra mobile PCs
- laptops
- smart phones
- personal digital assistants (PDAs)
- smart pens
- MP3 players
- digital and video cameras
- video-conferencing cameras
- digital sound recorders
- digital data loggers
- digital microscopes
- global positioning system devices
- virtual reality simulators
- games consoles.

Despite these very real issues of access, ICT plays a greater role in the lives of young Australians experiencing social, cultural and economic marginalisation than has been previously assumed. Many of these young people readily use instant messaging services, email and social networking sites to communicate and maintain relationships with other young people or significant adults including their teachers (Blanchard et al 2007). For example, young participants undertaking training in hospitality as part of the STREAT[34] social enterprise for homeless young people note that despite not having a permanent address, they own their own phones and laptops and depend on a constant access to technology (learner interviews, 2011).

Other young people may, however, be less confident in their use of technology. While they might be perfectly able to access YouTube or chat on Facebook with their peers, some teachers and trainers testify that these young people may not be able to use email or employ technology to write up a resume (national forums, 2011). A study conducted on behalf of the Australian Government indicates that the capacity of young learners to effectively use technological tools varies considerably (Education Services Australia, 2009c). Parental influence and family background plays a role here as well. In 2005, for example, only one third of Australian school students whose parents were in unskilled occupations attained proficiency in digital literacy (MCEETYA, 2005). Such young people are also less likely to use the internet for purposes related to their schooling (Australian Communications & Media Authority, 2009b). These findings are borne out by comments from participants in the online youth forum, some of whom describe quite low technological skill levels among their peers.

They are also supported by recent research findings that educators make overly optimistic assumptions about the degree of digital literacy that young people are bringing into the learning context. One study found that young learners perform considerably less well on tasks requiring a sophisticated use of ICT and need far more support and guidance than is assumed by their teachers (Lovell & Baker, 2009). A second found that young learners were unsure about what a podcast was, despite their regular use of YouTube. The eight learners in this second study – teenagers disengaged from

[34] http://www.streat.com.au

traditional education – were reluctant to use email, wikis or custom-made platforms and preferred to communicate via the more interactive and less text-heavy MySpace (Pedley & Wakelam, 2007). A third study found that even where young learners use technology on a daily basis for personal purposes, this does not automatically translate into a meaningful use of technology for learning (Kennedy et al, 2008).

A recent study undertaken for the Framework interrogates the concept of 'digital natives'. This term, coined by Marc Prensky in 2001, suggests that young people are naturally proficient with technology because they have grown up with it. The study challenges this popular assumption with the finding that the most successful e-learners in the VET sector are in fact those who are aged *over* 25 years old and who are in employment. The report acknowledges that "*digital natives have better ICT skills and social software skills than many of their VET teachers*" but also notes that "*digital natives need to realise that confidence in the use of ICT and social software does not guarantee success as an e-learning student. There will be issues of maturity, self-discipline and organisational skills that need to be addressed*" (Dowd, 2010, p.17). Of five age groups surveyed, the digital native group were least in agreement that e-learning had given them flexibility in their learning and that e-learning had enhanced their enjoyment of learning.

Findings like these highlight the need for future strategies to recognise that young learners have different needs and requirements in relation to their ICT use for learning, that their prior knowledge of ICT needs to be assessed before competency is assumed, and that they will continue to need support in the effective use of ICT, which will in turn require an ongoing commitment of resources by VET learning organisations and systems (Education Services Australia, 2009c).

KEY MESSAGES:

- *Unequal access to ICT risks exacerbating existing patterns of disadvantage amongst young learners.*
- *Many young people are unable to rely upon the provision of appropriate technology by their educational organisations.*
- *Assumptions and generalisations about young people's technological access, digital literacy and ease of use must be avoided.*

The message, not the medium

Despite the obvious importance of ICT access and competency, technology in itself is not sufficient to ensure the engagement of young learners: "*it isn't technology per se that makes learning engaging for the Net Gen; it is the learning activity*" (Oblinger & Oblinger, 2005, p. 2.16). Ironically, one of the traps for education and training practitioners is venerating the technology too greatly, focusing more on the medium than on the quality learning it can enable.

Eight years ago, the available research indicated that technology was tending to drive pedagogy in Australian VET settings. (Brennan, 2003). More recent reports have made the same observation that technology was driving education and training, rather than learning outcomes. They have highlighted the importance of using technologies to enhance learning rather than embracing them for their own sake (Education Services Australia, 2005; McDonald et al, 2006). In research undertaken for NCVER, Jane Figgis points out the inseparability of technology and pedagogy in e-learning, reminding practitioners that teaching and content should not be back-fitted to technology. It can be more effective to "*play with the technology and then think how it might be used*" (2009, p.15). This message is supported by the experience of one practitioner who participated in the project's national forums. She reports that her understanding of virtual worlds and their applicability to her area of study came only

after she had taken the time to explore the Second Life[35] program and found herself absorbed by it (national forums, 2011). The value of this personal immersion is echoed by one young learner:

> *"I think that educators and teachers should try and be aware of, and keep up with, the ways in which the young people they are educating use technology as I think this would help them to better use technology to help their learners. I also think that teachers and educators should ask learners what things are/aren't working for them and what things they would like to see tried." (participant, online youth forum, 2010).*

One risk of approaches that focus too centrally on the technology itself is that they overlook other important components of engaging learning environments. Melbourne's STREAT program demonstrates the value of using technology to enhance – rather than direct – learning and information sharing among marginalised young people.

Case study: STREAT partners with TAFE providers and community organisations to provide a range of support and career development opportunities for young trainees. These include social support, vocationally recognised training in hospitality and a food-service business that provides on-the-job training and work experience. While the majority of coursework is delivered through a traditional face-to-face model, STREAT uses technology innovatively to support informal learning and life skills, improve social connection and enable trainees to share their stories and experiences through a range of digital media. STREAT's Creative Voices program connects young people to their peers, the service and the community through digital storytelling, Twitter, Facebook and blogs (Scott, 2010 pers comm).

This kind of versatility in the use of technology is far from widespread, however. There are the signs that this situation is improving. Early findings from the 2011 E-learning Benchmarking Student Survey suggest that e-learning is being pursued less for its own sake and that some practitioners are instead paying greater attention to the quality of teaching and training delivery (Australian Flexible Learning Framework, forthcoming). These practitioners are both selective and creative about when, how and where they use technology in their practice. Nonetheless, some practitioners still report a tendency on the part of their colleagues to satisfy the e-learning component of their courses simply by uploading reams of text to the organisation's LMS (national forums, 2011). This implies an assumption that technology must be used but an unwillingness or inability to investigate how it might be used most effectively.

KEY MESSAGES:

- *Technological access does not by itself guarantee quality and engaging learning for young people.*
- *Unfamiliarity with ICT or a dismissive approach to its role in learning prevents practitioners from realising its full potential for young learner engagement.*
- *Practitioners should experiment with technology to find out which programs and devices are best suited to their work and the needs of their learners.*

Skilling practitioners

> *"Educating a millennium learner is a difficult thing because it was not how I learnt, and I'm finding myself having to learn along the way." (participant,national forum, 2011).*

This last point leads to one of the most fundamental barriers to the effective use of ICT to improve the engagement of young learners: the fact that teaching practice in

[35] http://www.secondlife.com

Australian learning organisations has not been particularly influenced by ICT and that many practitioners lack the skills or training to use it effectively. As one report notes:

> *"The fast pace of technological change has meant that teachers have been presented with many new developments and tools from this field in a relatively short period of time. Some educators resist such changes, some embrace them enthusiastically." (Duncan-Howell & Lee, 2007, p.228).*

Only a few years ago, Cisco noted that most school systems, including Australian systems, had not revised their operations to reflect current learning trends or technologies (2007). Around the same time, it was found that fewer than 30% of Australian school practitioners described themselves as being confident or proficient in the use of ICT in the learning setting, were knowledgeable about their use and value or had undertaken professional development in this area (Reimann et al, 2009).

The evidence suggests that this lack of confidence and proficiency extends to the VET sector. The Framework's 2010 national E-learning Benchmarking survey[36] of more than 2,000 VET teachers and trainers shows that in the 12 months prior to the survey, 32% had not delivered VET units that used e-learning and 33% had never used e-learning as part of their VET teaching or training. Of the remainder who had used e-learning approaches over the preceding 12 months, two thirds or more had not used web 2.0 technologies, social networking technologies, mobile technologies, voice technologies, podcasting, virtual learning environments, online recognition of prior learning, virtual worlds or e-portfolios. Of the 13 e-learning technologies recognised by the Framework, only three had been used by more than 50% of the teachers and trainers surveyed.

The same data reveals that just 39% of VET teachers and trainers were using mobile technologies in learning, assessment or communication. This trend is easier to understand when we consider the finding that many VET professionals make little use of these technologies in their own lives. Outside the teaching or training setting, a surprising 12% of the teachers and trainers surveyed never or hardly ever used a mobile phone. Nearly half never or hardly ever used an MP3 player or iPod. More than half never or hardly ever used Facebook. Ninety-one percent never or hardly ever used Twitter and 96% never or hardly ever used MySpace. Only 6% wrote blogs with any frequency: more than three quarters had never done so at all (Australian Flexible Learning Framework, 2010a).

This pattern is borne out by the findings of the 2009 national E-learning Benchmarking Student Survey. Over two thirds of respondents indicate that their course makes no use at all of mobile or voice technologies. Seventy-four percent state that their course makes no use of social networking technologies. Fifty-nine percent indicate that their course makes no use of virtual classroom environments and 81% indicate that it makes no use of virtual worlds. The picture is not wholly discouraging: the use of newer technologies is considerably lower than the use of more familiar technologies, but is growing steadily nonetheless, although it is growing from a lower base of adoption. What this suggests is that ICT is taken up in education and training environments only once it becomes established within society: as new technologies emerge and their usage becomes normalised within society, they find their way into education and training. This indicates that the practice within education and training is lagging behind wider social trends. If the Australian VET sector is to lead and not simply react to these trends, change is clearly needed.

A study conducted on behalf of the Australian Government contributes some additional insights. It indicates that the capacity of education practitioners to effectively use web 2.0 learning tools varies considerably, as does their take-up of the tools. It also indicates that access by practitioners to these tools and their enabling

[36] http://flexiblelearning.net.au/e-learningindicators

infrastructures varies between jurisdictions, sectors and organisations. More worryingly, it points to limited professional learning opportunities for either current or new, pre-service practitioners to develop expertise in the use of these tools (Education Services Australia, 2009c).

Case study: The Growing Tall Poppies program at Melbourne's Santa Maria College has effectively combined several learning styles, and is an example of collaborative e-learning in a metropolitan context. The program encourages girls in the middle years of schooling to pursue studies in the physical sciences by offering them authentic experiences in university science laboratories and in Melbourne's world-class synchrotron. They might manufacture proteins, or analyse the chemical make-up of a fossilised insect. The program uses inquiry-based pedagogy, or 'learning where the end product may actually be another question', and includes an online forum designed to guide learners through a number of tasks and to facilitate debate. After each laboratory visit, a set of research questions are posed, with learners posting further questions to each other and to their practitioners. This kind of interaction allows the learners to be 'contributors to the process of discovery', while scientists from the laboratories act as mentors and join the forum for one hour every Friday. (Barone-Nugent, pers comm.).

This situation does not go unnoticed by young learners. Learners who participated in the online youth forum highlight the negative impact of their teachers and trainers' lack of knowledge in what they consider everyday ICT practices such as social networking, uploading and downloading content, and creating multimedia content. A number of these young learners encourage practitioners to meet this challenge head on by simply talking to their students. As one learner says:

> *"Be open to using technology in your practice. We young people live in a world of technology, so we know our stuff. If you are unsure about how to use something, let us know, because we would be more than happy to help you understand it. Especially if we know that it is going to be used in supporting and engaging other young people. If you want to know more about mobiles, let us talk to you about them. If you want to understand how to surf the net for places that we young people hang at, give us this knowledge so we can inform you. Be open with us, and we will be open with you." (participant, online youth forum, 2010).*

It is not only the technological skills of practitioners that are important in creating an engaging learning environment. For young Indigenous learners, for example, successful e-learning relies on the presence of "*committed and sensitive staff, preferably Indigenous staff, who build strong rapport with their learners and communities*" (McDonald et al, 2005, p. 7). The same applies to disengaged young learners: they both want and respond well to an individual, personalised relationship with their teacher or trainer. Few staff seem to combine a confident use of ICT for learning with the ability to work well with Indigenous learners (McDonald et al, 2005). Equally, practitioners who have widespread experience in working effectively with disengaged learners may not be proficient or passionate about the use of ICT for learning (Ison et al, 2004).

If practitioners are falling behind in their skilled use and application of ICT for learning, their organisations may not always be helping. We have already described the consensus amongst the learners and practitioners who were consulted for this project that access to ICT resources is limited, and often insufficient. This is borne out by surveys conducted by the Framework. The 2010 teacher/trainer survey shows that nationally, only 31% of VET teachers and trainers rate their access to computers and the internet for teaching or training as excellent. Thirty-six percent rate their access to e-learning resources as less than adequate. Thirty-three percent make the same observation about their access to professional development that could support their

use of e-learning. Less than half feel that they are strongly encouraged by management to use e-learning or feel well supported by their organisation in e-learning, even though a majority believe that the use of e-learning is a priority for their organisation (Australian Flexible Learning Framework, 2010a).

Practitioners who participated in the national forums note that e-learning is not yet a compulsory part of the VET curriculum or of VET teacher training. Even those practitioners who undertake training or professional development do not necessarily come away with an understanding of the pedagogy behind e-learning. Teacher fatigue, lack of time and insufficient funding for the development and maintenance of online content are cited as common concerns, together with a fear of being unable to master the technology or of losing control:

> *"The teachers themselves can be a barrier because they often lack confidence. This is then coupled with an adversity to 'handing over to the learners' and asking their advice about a particular aspect of technology. Teachers and trainers have to start thinking differently, and realise that while they may be the content expert, it is OK to ask advice from learners about the best way to achieve something [using technology]." (participant, national forum, 2011).*

KEY MESSAGES:

- *Many practitioners lack the skills or training to effectively incorporate ICT in their teaching practice.*
- *Some practitioners are inhibited by unfamiliarity with technology: others are limited by obstructive organisational policy or lack of funding and training.*
- *E-learning is not a compulsory part of the VET curriculum or of VET teacher training.*

Leadership and organisational policy

This leads on to one of the most frequently cited obstacles to the effective and creative use of ICT for the engagement of young learners in the VET sector. There is a uniform sense among the participants of the national forums that some of those in leadership and decision-making positions have fixed ideas about what constitutes training, literacy and job skills and have to be constantly convinced of the benefits of a strong ICT component in teaching and learning. It is felt that the use of web 2.0 and multimedia tools in particular is often seen as 'playing' and is not taken seriously as a pedagogical practice.

As practitioners point out, this kind of 'playing' can be essential in the creation of advanced skill development and real employment opportunities. Familiarity with ICT through creative activity and daily communication can also help learners to use other online programs for learning. Participants note that:

> *"Public internet access and training is very much orientated around the employment side of [things] but is not really addressing the need to build up the everyday skills." (participant, national forum, 2011)*

> *"One of the struggles with all of this is there's a disconnect...between the provision of new training strategies, the approaches to multimedia, and the hardware involved. The two aren't really talking to each other. The people in the Department of Broadband, Communications and Digital Economy aren't really talking to the people on the ground. They're implementing things without that relationship. There's a whole group of us who have been trying to bridge the gap between the two worlds." (participant, national forum, 2011).*

A persistent theme of the forums is that the attitude of organisational heads is enormously influential in determining the use of ICT for learning and that responsibility for the effective implementation of ICT in the VET sector cannot be handed directly to practitioners without the endorsement of leadership. This is supported by research

that shows how leadership is critical to sustaining e-learning innovations (Callan and Bowman, 2010). Some practitioners report that their organisations ban blogging and punish young learners who post their assignments on the web. One practitioner notices a perception at all levels of management in her organisation that "*virtual learners aren't real learners*". These anecdotes point to an organisational culture and climate that is dramatically out of touch with the realities of young learners' experience and preferred learning styles.

Some practitioners also report difficulties working with the staff in charge of ICT services. While ICT staff are technologically proficient, they can lack an understanding of the pedagogy behind e-learning and of wider trends in social technology that are making their way into the learning context. This can show itself in numerous ways, including fixed attitudes to the brand of hardware or software that is made available to VET practitioners. One practitioner working with Indigenous learners in remote communities has found that Macintosh mobile devices are particularly user-friendly and effective in building literacy skills in this context, but had to undertake a concerted lobbying campaign for permission to use Macintosh hardware. This lobbying culminated in a debate with senior executive in which she was asked to justify her teaching methods before permission was finally granted.

Given the high development costs of tailored online programs together with site maintenance costs and content production, funding is another constant issue for practitioners. Only two forum participants report strong levels of support and funding for ICT-related programs in their organisations. In the first case, management has encouraged practitioners to develop their own programs but offers generous funding once the efficacy of those programs is proven. In the second, a stand-alone department has been established with the sole purpose of developing online programs for practitioners to use. Many organisations offer, or even require, training in ICT for staff, but without e-learning being a compulsory part of VET practitioner training and content delivery in the first instance, these professional development sessions are viewed by some as tokenistic or ineffective.

Beyond these practical barriers, a more bureaucratic obstacle emerges from organisational policies and procedures. Many practitioners note that e-learning resources have to be audited and approved before they can be used: this discourages them from either creating new resources or improving old ones. Departmental codes of conduct also prevent practitioners from using certain websites or, in some cases, from contacting their learners via SMS. Some require special permission before practitioners or learners can use webcam devices. In a number of instances, concerns about online copyright and plagiarism issues mean that exams are still frequently conducted by the old means of paper and pen, even where learners are studying information technology. With e-learning generating large amounts of online content, storage capacity and security are also raised as an issue. Security fears and compliance issues are constantly cited as obstructive in the effective use of ICT by practitioners.

This obstruction is not universally the case: practitioners from private organisations describe a greater degree of freedom in their use of ICT and access to websites. Those in public organisations, however, consistently call for greater access to virtual communities (such as Second Life), social networking sites such as Facebook and Twitter, and information sharing sites like YouTube. Some have found that the LMS employed by their organisation restricts access to certain course materials and related resources. Others are frustrated by rigid course content that is set by their organisations and is unable to be modified. They call for higher levels of flexibility and smaller classes to allow for a more personal approach to learning.

KEY MESSAGES:

- *Organisational and logistical barriers to the use of ICT are preventing innovative and engaging practice in the VET sector.*
- *Cooperative leadership and support are of crucial importance in redressing these barriers.*
- *In the absence of such support, innovative practitioners are taking practice outside of the organisation. This places undue time pressure upon them as well as creating risk and limiting system-wide improvements.*

Recommendations

There is substantial evidence that the creative and strategic use of ICT can help to engage disengaged young learners and improve their learning outcomes. There is also substantial evidence that more remains to be done to maximise this use and ensure that all young learners are engaged and achieving at the most optimal level. The following recommendations arise from the research undertaken to inform this report:

1. **In order to be effective in the VET sector, ICT should be used to promote a tailored and learner-centred pedagogy based upon the current use of technology by young people**. A one-size-fits-all approach will not be successful in engaging young learners, nor will the simple transfer of written content online. The multimedia and interactive functions of web 2.0 must be fully used, along with the emerging practices made possible by smart phones and mobile technology. Relevance and convenience of content is crucial for engagement. Blended delivery is ideal.
2. **Effective implementation of ICT in the VET sector relies upon strong endorsement from organisational leaders.** In particular, rigid organisational policies and codes of conduct must be reviewed to facilitate the effective use of ICT for learning across the sector.
3. **Substantial investment is required to build the capacity of VET practitioners to use ICT with confidence**. Staff must have ongoing professional development to equip them with current technical skills and to support them in understanding the role of ICT in young people's everyday lives. Only practical, sustained examples that demonstrate real results will serve to convince practitioners to change and/or improve their practice. One solution might be the development of a central resource to showcase online examples of good practice (ie screencasts, digital diaries of teachers, videos of classes in action) that allow practitioners to visualise the technology at work. This may even be imagined as an interactive map, allowing practitioners to find out what kinds of projects and technological innovations are underway in their local area. Staff could benefit from personal learning plans in ICT, and from mentoring programs. Allocated and paid time for training and resource development must be considered. Rewards programs for teacher innovation may also be successful.
4. **Organisational and system VET policies cannot assume equality of access, nor can they assume uniform levels of competency in ICT**. Learning policies should be developed with input from young people and should be based upon principles of diversity and flexibility, bearing in mind the caution that "*policy does not deliver practice*" (Figgis, 2009, p.15). Online training for remote youth might be considered, along with improved ICT access at community centres or learning hubs. Equipment hire systems should be

considered, along with centralised IT support systems that are open 24 hours a day and seven days a week.

5. **Further research is required and must be undertaken collaboratively with policymakers, practitioners and young people**. While Cisco has already flagged the emergence of Education 3.0 as the new paradigm of 21st century learning (2007), there is still a marked lack of reliable and original research and evaluation evidence in relation to the use of social or interactive technologies in pedagogy (Anderson, 2007). Further research must build on the work of the Framework, which was launched as an e-learning strategy specifically for the VET sector and has funded dozens of E-learning Innovations projects[37] to inform and model good practice.

References

ABS. (2007) *Household Use of Information Technology, Australia 2005-06*, Australian Bureau of Statistics, Canberra.

Australian Communications & Media Authority (2009a) *Click & Connect: Young Australians' Use of Online Social Media – Pt1*. Australian Communications & Media Authority, Canberra.

Australian Communications & Media Authority (2009b) *Click & Connect: Young Australians' Use of Online Social Media – Pt2*. Australian Communications & Media Authority, Canberra.

Anderson, P. (2007) 'What is Web 2.0? Ideas, technologies and implications for education', *JISC Technology and Standards Watch,* February.

Australian Flexible Learning Framework (2008). *Case Study: Anangu Online: Virtual Library and Champions, APY Lands TAFE SA Regional*, Australian Flexible Learning Framework, Canberra

Australian Flexible Learning Framework (2010a) *2010 E-learning Benchmarking Report: Survey Result.* Retrieved from http://e-learningindicators.flexiblelearning.net.au/survey_results_all.htm, 28 November 2010.

Australian Flexible Learning Framework (2010b) *E-learning Innovations Projects 2010*, Retrieved from http://flexiblelearning.net.au/innovations, 29 November 2010.

Blanchard, M., Metcalf, A. & Burns, J. (2007) *Marginalised young people's use of Information and Communication Technology*, Inspire Foundation, Sydney.

Boase, J., Horrigan, J.B., Wellman, B. & Raine L. (2006) *The Strength of Internet Ties: The Internet and email aid users in maintaining their social networks and provide pathways to help when people face big decisions*: Pew Internet & American Life Project, Washington.

Brennan, R., McFadden, M. & Law, E. (2001) *All that glitters is not gold: online delivery of education and training.* Retrieved from http://ncver.edu.au, 12 October 2010.

Brennan, R. (2003) *One size doesn't fit all: Pedagogy in the online environment – Volume 1.* Retrieved from http://ncver.edu.au, 11 October 2010.

Callan, V. and Bowman, K. (2010) *Sustaining E-learning Innovations: A review of the evidence and future directions - Final report*, Australian Flexible Learning Framework, Canberra.

[37] http://flexiblelearning.net.au/innovations and http://trainingo2.net/eli/search2.php

Cisco (2007) *Equipping every learner for the 21st century: A white paper*. San Jose: Cisco Systems, Inc. Retrieved from http://newsroom.cisco.com/dlls/2008/ekits/Equipping_Every_Learner_for_21st_Century_White_Paper.pdf, 10 November 2010

Collin, P. & Burns, J. (2009) 'The experience of youth in the digital age', in Furlong, A. (ed.) *Handbook of Youth and Young Adulthood: New Perspective*s. Routledge, Oxford.

Curriculum Corporation (2009) *Using The Le@rning Federation digital curriculum resources to enhance the education of Indigenous learners,* Curriculum Corporation, Carlton South.

Department of Education and Early Childhood Development (DEECD) (2010) Listen2Learners event held at State Library of Victoria, Monday 11 October 2010. Retrieved from http://www.education.vic.gov.au/researchinnovation/events/listentolearners, 12 October 2010.

Department of Education, Employment and Workplace Relations (DEEWR) (2011) *Experience the Digital Education Revolution*. Retrieved from http://www.deewr.gov.au/Schooling/DigitalEducationRevolution/FAQs/Pages/HighSpeedBroadbandToSchoolsFrequentlyAskedQuestions.aspx, 3 April 2011.

Department of Education, Science and Training (DEST) (2006) *Employability Skills: From Framework to Practice*. Retrieved from http://www.training.com.au/documents/Employability%20Skills_From%20Framework%20to%20Practices.pdf, 28 November 2010.

Dowd, S. (unpublished). *Digital Natives Rule!?? An Evaluation of the Uptake of E-learning by Young Australians within the VET Sector*.

Duncan-Howell, J. & Lee, K.T. (2007) *M-learning: Finding a place for mobile technologies within tertiary educational settings.* Proceedings of the ascilite conference, Singapore 2007.

Education Services Australia (2005) *Emerging technologies: A framework for thinking*. Retrieved from http://www.det.act.gov.au/__data/assets/pdf_file/0010/74485/ACT_EmTech_Report_v1_2.pdf, 4 November 2010.

Education Services Australia (2009a) *21st century learning spaces*. Retrieved from http://educationau.edu.au, 6 October 2010.

Education Services Australia (2009b) *Annual report on emerging technologies: planning for change*. Retrieved from http://educationau.edu.au, 6 October 2010.

Education Services Australia (2009c) *Collaboration in teaching and learning*. Retrieved from http://educationau.edu.au, 6 October 2010.

Figgis, J. (2009) *Regenerating the Australian landscape of professional VET practice: Practitioner-driven changes to teaching and learning*, NCVER, Adelaide.

Freebody, P., Reimann, P. & Tiu, A. (2008) *Alignment of perceptions about the uses of ICT in Australian and New Zealand schools: Brief Review of Research Literature on the Benefits of ICT use in School.* Retrieved from http://www.thelearningfederation.edu.au/verve/_resources/Survey_Report.pdf, 4 November 2010.

Heppell, S. (no date). Retrieved from http://rubble.heppell.net/learnometer/trends_discussion.html, 1 November 2010.

Ison, A., Hayes, A., Robinson, S. & Jamieson, J. (2004) *Txt Me: supporting disengaged youth using mobile technologies.* Australian Flexible Learning Framework. Retrieved from http://pre2005.flexiblelearning.net.au/projects/media/txt_me_recommendations.pdf, 1 December 2010.

Ito, M., Horst, H., Bittanti, M., Boyd, D., Herr-Stephenson, B., Lange, P.G., Pascoe, C.J. & Robinson, L. (2008) *Living and Learning with New Media: Summary of Findings from the Digital Youth Project.* The John D. and Catherine T. MacArthur Foundation.

Johnson, L., Smith, R., Willis, H., Levine, A. & Haywood, K. (2011). *The 2011 Horizon Report.* Austin, The New Media Consortium, Texas.

Kennedy, G.E., Judd, T.S., Churchward, A. & Gray, K. (2008) 'First year learners' experiences with technology: Are they really digital natives?' *Australasian Journal of Educational Technology*, vol. 24, no. 1, pp. 108-122.

Kimber, K. & Wyatt-Smith, C. (2010) 'Secondary learners' online use and creation of knowledge: Refocusing priorities for quality assessment and learning'. *Australasian Journal of Educational Technology,* vol. 26, no. 5, pp. 607-625.

Kral, I. (2010) *Plugged in: Remote Australian Indigenous youth and digital culture*. Centre for Aboriginal Economic Policy Research, Research School of Social Sciences, The Australian National University, Canberra.

Lovell, S. & Baker, S. (2009) 'Digital narratives of youth transition: Engaging university learners through blended learning', *Youth Studies Australia*, vol. 28, no. 4, pp. 52-59.

McDonald, R., O'Callaghan, K., Walker, A. & Fyffe, J. (2006) *2005 Indigenous Engagement Project Report.* Australian Flexible Learning Framework Retrieved from http://pre2009.flexiblelearning.net.au/flx/webdav/site/flxsite/shared/Indigenous%20Engagement/2005_Indigenous_Engagement_Final_Report.pdf, 1 November 2010.

Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) (2005) *National Assessment Program – ICT Literacy Report Years 6 & 10, 2005*. Ministerial Council on Education, Employment, Training and Youth Affairs, Carlton South.

Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) (2008) *Learning in an online world.* Ministerial Council on Education, Employment, Training and Youth Affairs, Carlton South.

Misko, J., Choi, J., Hong, S.Y. & Leel, I.S. (2004) *E-learning in Australia and Korea: Learning from practice.* Retrieved from http://ncver.edu.au, 6 October 2010.

Montgomery, K., Gottlieb-Robles, B. & Larson, G.O. (2004) *Youth as E-Citizens: Engaging the Digital Generation*. Retrieved from http://www.centerforsocialmedia.org/ecitizens/youthreport.pdf, 6 October 2010.

Mossuto, M. (2009) *Problem-based learning: Learner engagement, learning and contextualised problem-solving.* Retrieved from http://ncver.edu.au, 6 October 2010.

NCVER (2010) *Australian vocational education & training statistics: Apprentice & trainee destinations 2010*, NCVER, Adelaide.

Not School (2009) Retrieved from http://www.notschool.net/Library/, 1 November 2010.

Oblinger, D.G. & Oblinger, J.L. (2005) 'Is It Age or IT: First Steps Toward Understanding the Net Generation'. In Oblinger, D.G. & Oblinger, J.L. (eds).

Educating the Net Generation. Retrieved from http://educause.edu/educatingthenetgen/, 30 September 2010.

Office for Education Policy and Innovation (2007) *Personalising Education: from research to policy and practice,* Department of Education, Melbourne.

Pedley, J. & Wakelam, H. (2007) *Case Study, Inclusive e-Learning Project, W.A.: Heutagogy: Using technology to create new learning cultures*, Australian Flexible Learning Framework.Canberra. Retrieved from http://pre2009.flexiblelearning.net.au/flx/webdav/shared/Inclusive%20E-learning/Case%20Study%20Heutagogy_final.pdf, 30 September 2010.

Prensky, M. (2005) 'Engage me or enrage me: what today's learners demand'. *Educause review,* September/October, pp. 60-64.

Ragus, M. (2004) *Mobile learning: handheld innovations in flexible learning*. Australian Flexible Learning Framework. Retrieved from http://mobilelearning.flexiblelearning.net.au/index.htm, 30 September 2010.

Ramaley, J. & Zia, L. (2005) 'The Real Versus the Possible: Closing the Gaps in Engagement and Learning'. In D.G. Oblinger, & J. L. Oblinger (eds). *Educating the Net Generation*. Retrieved from http://educause.edu/educatingthenetgen/, 30 September 2010.

Reimann, P., Freebody, P., Hornibrook, M. & Howard, S. (2009) *Immersive learning environments: A study of practitioners' innovation using The Le@rning Federation's digital learning resources, Centre for Research on Computer-supported Learning and Cognition (CoCo), Faculty of Education and Social Work, The University of Sydney, Sydney.*

Rideout, V.J., Foehr, U.G. & Roberts, D.F. (2010) *Generation M2: Media in the Lives of 8 to 18 year olds,* Kaiser Family Foundation, Menlo.

Robinson, L. & Lamb, S. (2009) *How Young People are Faring 2009*, The Foundation for Young Australians, Melbourne.

Robinson, L., Lamb, S. & Walstab, A. (2010). *How Young People are Faring '10*, The Foundation for Young Australians, Melbourne.

Shao, G. (2008) *Understanding the appeal of user-generated media: a uses and gratification perspective.* College of Communication and Information Sciences, University of Alabama, Tuscaloosa, Alabama, USA.

Star S. & Boweker G. (2006) 'How to infrastructure' In: A. Lievrouw, S. Livingstone, (eds) *Handbook of New Media*, 2nd edn, Sage, London. pp. 230-245.

Stephens-Reicher, J., Metcalf, A., Blanchard, M., Mangan, C. & Burns, J. (2010) *Reaching the hard-to-reach: How Information Communication Technologies (ICT) can reach young people at greater risk of mental health difficulties*. Inspire Foundation and Oxygen Youth Health Research Centre, Sydney and Melbourne.

The Smith Family (2008) *Digital Literacy: Connecting communities through technology.* Retrieved from http://thesmithfamily.com.au, 4 November 2010.

Third, A. & Richardson, I. (2009) *Analysing the impacts of social networking for young people living with chronic illnesses, a serious condition or disability: An evaluation of the Liverwire online community.* Centre for Everyday Life, Murdoch University, Perth.

Valkenburg, P.M. & Soeters, K. (2001) 'Children's positive and negative experiences with the Internet', *Communication Research*, vol. 28, no. 5, pp. 653-676.

Volkoff, V., Keating, J., Walstab, A. & Marr, B. (2006) *Effective TAFE, ACE & Private Provider Delivery to Young People, 15-24 Years Old (Project 11)*. Melbourne: Victorian Learning and Employment Skills Commission.

Wallace, M. (2008) *Effects of TLF curriculum content on Indigenous learners' motivation and engagement in learning,* The Le@rning Federation.

Walsh, L. (2009) *Online Curriculum Modelling for the National Curriculum. Invited Project Brief to the National Curriculum Board.*

Willms, J.D. (2003) *Learner engagement at school: A sense of belonging and participation. Results from PISA 2000*. OECD, Paris.

Wyn, J., Cuervo, H., Woodman, D. & Stokes, H. (2005) *Young people, wellbeing and communication technologies,* VicHealth, Melbourne.

Young, M., Robertson, P., Sawyer, G. & Guenther, J. (2005) *Desert disconnections: e-learning and remote Indigenous peoples.* Australian Flexible Learning Framework. Retrieved from http://www.icat.org.au/media/Research/telecommunications/desertdisconnections-elearning-and-remote-indigenouspeoples-2005-AFLF.pdf, 4 November 2010.

For more information:

For more information on the Benchmarking and Research business activity

Phone: (08) 8226 0803

Email: melanie.worrall@sa.gov.au

Website: flexiblelearning.net.au/research

For more information on the Australian Flexible Learning Framework

Phone: (07) 3307 4700

Email: enquiries@flexiblelearning.net.au

Website: flexiblelearning.net.au