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This issue of *Learning Communities: International Journal of Learning in Social Contexts* focuses on the use of digital portfolios, or e-Portfolios, to support learning. The series of seven articles evolved from presentations given at the second Australian e-Portfolio Symposium, held in Brisbane in early February 2009. Queensland University of Technology (QUT) has been the lead institution in the Australian e-Portfolio Project (AeP), a national study funded by the Australian Learning and Teaching Council (ALTC) to investigate the use of e-Portfolios in higher education. The second stage of the research project seeks to examine the factors that contribute to the sustainability of an e-Portfolio community of practice.

Within the broad context of learning, there are many different terms that relate to the concept of e-Portfolios: primary and secondary teachers often use terms such as ‘digital portfolios’, ‘digital storytelling’ and ‘digital learning portfolios’; higher education practitioners prefer ‘electronic portfolios’, ‘e-portfolios’, ‘web folio’ and ‘e-folio’; while in the corporate sector terms such as ‘performance management tools’, ‘career management tools’ and ‘personal development planning records’ refer to similar systems and activities.

The information contained in an individual’s e-Portfolio will inevitably include an extensive assortment of information, including personal information, education history, artefacts of recognition (e.g. awards and certificates), coursework (e.g. assignments and projects), instructor feedback and comments, reflective commentary, career goals and objectives, personal values and interests, volunteer and professional development activities. Beyond this, however, it must be remembered that the term ‘e-Portfolio’ can refer to both the product and the process (Barker, 2006). An e-Portfolio, as a product, provides a personal space where learners can collect the digital artefacts that present evidence of their experiences and achievements, articulating actual learning outcomes. The e-Portfolio, as a process, allows learners to move beyond *what* they have learned to consider *how* they have learned and to understand the connections inherent in the creative process of learning.

The articles presented in this issue reflect the diversity of e-Portfolio practice in a range of learning contexts. Ruth Wallace, from Charles Darwin University, considers the potential of e-Portfolios to empower disenfranchised learner identities by encouraging the
individualisation of learning, through the presentation of materials in textual, visual and audio formats, to establish ways of connecting to others in a meaningful way. The theme of the creation and presentation of multimedia materials is continued by Hazel Owen, from Unitec NZ, who investigates the benefits inherent in Web 2.0 technologies, including ease of use, accessibility from mobile devices, the potential for collaboration, informal leaning and peer input, taking the e-Portfolio beyond the immediate context of a formal learning setting. The article includes a research study of e-Portfolio use at the Dubai Men’s College, which has informed a further e-Portfolio initiative at Unitec NZ. Beverley Oliver and the team at Curtin University also explore the use of Web 2.0 and social networking features of the iPortfolio, which has been developed within the framework of curriculum renewal, with the goal of enabling students to support the attainment of graduate attributes through critical reflection and collaboration with peers, employers and learning facilitators.

In his article, Peter Rees Jones, from the University of Leeds in the United Kingdom, examines the role of e-Portfolios in e-Recruitment, to consider the ways in which e-Portfolios might improve the quality of employment applications and beyond this into wider human resources practice, taking into account the desired data structures and interoperability between systems. Allison Miller, from the Australian Flexible Learning Framework, reports on the need to support learner mobility, recognition of prior learning and lifelong learning. The article provides an overview of current policy and practice in the vocational education and training (VET) sector, which is underpinned by the VET E-portfolio Roadmap, a national strategic plan to support the various technical requirements for e-Portfolios.

The institutional perspective is examined in the paper by Margaret Faulkner (University of South Australia) and Garry Allan (RMIT University) through a discussion on the merits of collaboration across the different dimensions of e-Portfolio practice, including discipline areas, information technology, and teaching and learning support. In presenting a case study of e-Portfolio support activities at UniSA and RMIT, the authors argue that collaborative efforts involving aligned institutions and staff can reduce isolation and encourage a sense of community. For academic or teaching staff, e-Portfolios can play a significant role in helping them to articulate their understandings about their own teaching. Gail Wilson and Rozz Albon from Bond University outline the application of a digital teaching portfolio in a course designed for staff who are new to university teaching and learning. In this context there are again linkages to career development, as the process of developing a portfolio to demonstrate learning and achievement serves as the stimulus for the process of academic promotion or awards for teaching excellence.
Individually, each article provides insights into the issues associated with a specific aspect of e-Portfolio practice in many different situations. Collectively, the articles present a rich tapestry of e-Portfolio processes, with a keen focus on the value of learning communities, which are integral to sustainability in the area of e-Portfolio research and practice. Australian e-Portfolio Project: www.eportfoliopractice.qut.edu.au

Support for the Australian e-Portfolio Project has been provided by the Australian Learning and Teaching Council, an initiative of the Australian Government Department of Education, Employment and Workplace Relations. The views expressed in the articles do not necessarily reflect the views of the Australian Learning and Teaching Council.
Curtin's iPortfolio: Facilitating Student Achievement of Graduate Attributes Within and Beyond the Formal Curriculum

Beverley Oliver
Brian R. von Konsky
Sue Jones
Sonia Ferns
Beatrice Tucker

Abstract

This paper reports on progress with an electronic portfolio initiative underway at Curtin University of Technology in Perth, Western Australia. The electronic portfolio, branded the iPortfolio, has been piloted during 2009. This paper explains the features of the iPortfolio in its current stage of development, but more particularly how the iPortfolio meshes with and enhances the university’s teaching and learning philosophy and strategic direction as it is articulated through Curtin’s Curriculum 2010 project, a three-year institution-wide flagship initiative. In particular, the iPortfolio advances the curriculum renewal spearheaded through the Comprehensive Course Review process (using tools such as the Curriculum Map and the Needs Analysis). Central to Curtin’s strategic direction is the embedding and assessing of course and unit learning outcomes which are derived from Curtin’s nine Graduate Attributes. This paper emphasises how the Web 2.0 and social networking features of the iPortfolio, are designed to facilitate reflective and collaborative learning in both formal and non-traditional learning contexts such as volunteer organisations, student clubs, peer mentoring groups, and similar communities. Self- and peer assessment
and feedback are focal in the iPortfolio, particularly in relation to the attainment of the University’s Graduate Attributes. Beyond the planned formal curriculum (that is, what is detailed in the course curriculum map), the iPortfolio enables students to support claims of learning achievements by creating critical reflections, adding digital evidence, and drawing on invited feedback from and collaboration with peers, employers and learning facilitators. Students collate their overall achievement of the Graduate Attributes in a specific iPortfolio tab (the My Ratings tab), then rate their achievement using a five point scale. It is envisioned that these student self-rating data will in the future be triangulated with existing unit survey instruments and Curriculum Maps as part of the Comprehensive Course Review as a quality assurance process around student attainment of learning outcomes.

Introduction

Curtin University of Technology is Western Australia’s largest university with approximately 41,000 students, nearly 17,000 of whom are offshore and onshore international students. Since 2007 Curtin has been immersed in the Curriculum 2010 (C2010) project, which focuses on review of the pedagogical underpinnings of Curtin’s degrees, and how these can ensure student achievement of learning outcomes (and particularly Curtin’s Graduate Attributes) through creating sustainable courses of high quality (Curtin University of Technology, 2007). Some of the key outcomes of C2010 are that Curtin has (1) confirmed its Graduate Attributes and adopted the Triple-i Curriculum to describe its educational emphases, (2) implemented Comprehensive Course Review (and tools such as the Curriculum Map and the Needs Analysis) to embed the attributes and the Triple-i curriculum in the curriculum of every course (degree) in a transparent manner, and (3) adopted a university-wide electronic portfolio, branded the iPortfolio (to link with the Triple-i Curriculum) wherein students and staff can create, share and publish their evidenced achievements in relation to the Graduate Attributes. These key outcomes, and their interrelationships with each other and the Graduate Attributes, are illustrated in Figure 1:
Curtin’s Graduate Attributes and the Triple-i Curriculum

The learning outcomes for all Curtin courses are derived from and reflect Curtin’s nine Graduate Attributes. That is, the Graduate Attributes are contextualised, embedded and assessed as learning outcomes in units and must be achieved across the course. Curtin’s Graduate Attributes, like many other universities’ across the sector (Barrie, 2004; P. Hager, 2006; P. J. Hager & Holland, 2006; Precision Consulting, 2007), are a mixture of knowledge outcomes, generic skills and employment capabilities, as shown in Figure 2:

<table>
<thead>
<tr>
<th>1. Apply discipline knowledge principles and concepts</th>
<th>Apply discipline knowledge, understand its theoretical underpinnings, and ways of thinking; Extend the boundaries of knowledge through research.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Think critically, creatively, and reflectively</td>
<td>Apply logical and rational processes to analyse the components of an issue; Think creatively to generate innovative solutions.</td>
</tr>
<tr>
<td>3. Access, evaluate and synthesise information</td>
<td>Decide what information is needed and where it might be found using appropriate technologies; Make valid judgements and synthesise information from a range of sources.</td>
</tr>
<tr>
<td>4. Communicate effectively</td>
<td>Communicate in ways appropriate to the discipline, audience and purpose.</td>
</tr>
<tr>
<td>5. Use technologies appropriately</td>
<td>Use appropriate technologies recognising their advantages and limitations.</td>
</tr>
</tbody>
</table>
6. Utilise lifelong learning skills

- Use a range of learning strategies;
- Take responsibility for one's own learning and development;
- Sustain intellectual curiosity;
- Know how to continue to learn as a graduate

7. Recognise and apply international perspectives

- Think globally and consider issues from a variety of perspectives;
- Apply international standards and practices within a discipline or professional area.

8. Demonstrate cultural awareness and understanding

- Respect individual human rights;
- Recognise the importance of cultural diversity particularly the perspective of Indigenous Australians;
- Value diversity of language.

9. Apply professional skills

- Work independently and in teams;
- Demonstrate leadership, professional behaviour and ethical practices.

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**Figure 2: Curtin’s Graduate Attributes**

Curtin’s Triple-i Curriculum (shown in Figure 3) is a mnemonic which is intended to easily communicate the University’s goals and encapsulate the emphases of the Graduate Attributes: Curtin aims to produce highly-employable global citizens with expertise beyond their primary discipline (Hare, 2008; Hiatt, 2008). That is, all courses emphasise Industry focus for graduate employability, Indigenous /intercultural/ international awareness to foster global citizenship, and Interdisciplinarity in rich educational choices.

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**Figure 3: Curtin's Triple-i Curriculum**
Comprehensive Course Review

At Curtin, Comprehensive Course Review is the five-yearly review that analyses the entire academic program for a course; its regulations, structure (its units, major and minor sequences), currency of the curriculum, quality of teaching and learning, relevance of assessment tasks, fieldwork, projects and work experience, and any other aspects which comprise the award course (Oliver & Ferns, 2009). Comprehensive Course Review commences with a 360 degree-style Needs Analysis which collates the views of key stakeholders (students, recent graduates, employers and industry experts, and benchmarking partners) regarding student achievement of the course learning outcomes (Graduate Attributes) and the Triple-i Curriculum (Jones & Oliver, 2008; Oliver, Jones, Tucker, & Ferns, 2007). A second tool, the Curriculum Map (illustrated in Figure 4), shows how learning outcomes and assessments contribute to the achievement of course learning outcomes (Graduate Attributes) and the Triple-i Curriculum (Oliver, Jones, Ferns, & Tucker, 2007). In this way, the Curriculum Map shows the intended formal curriculum—that is, where teaching staff intends that the Graduate Attributes will be assessed. To use a metaphor, in any journey (even the ‘learning journey’), the map is not the destination, only the plan for how to get there. Likewise in the curriculum: the Curriculum Map can show the intentions of the curriculum, but the outcomes need to be tested elsewhere. At Curtin, outcomes are evident in formal assessment of student work, through self- and peer assessment in the iPortfolio, and in the monitoring of perceptions of success of graduates of up to five years (within the Needs Analysis).
Figure 4: Curriculum Map entry for the hypothetical unit Animal Science 100

The iPortfolio

Curtin’s iPortfolio is an online space for students and staff to create, collaborate, manage and publish evidence of their learning achievements and professional development. The system has been piloted in Semester 2, 2009, and staff and student feedback as well as reviews from international experts will be used to refine the system in preparation for full implementation in 2010. Students and staff (and in the future, alumni) can create an iPortfolio upon subscription and use the:

- **About Me** tab to create, share and manage a profile picture, an introduction, and information on their biography and goals;
- **My Ratings** tab to self-rate and provide evidence of achievement of Curtin’s Graduate Attributes and the Triple-i curriculum, then invite others to view or provide feedback;
- **My Courses** tab to create, share, manage and collaborate on assignment tasks, as well as create, share and manage evidence of learning in specific professional competencies;
- **My Employment** tab to create, share and manage a resume and evidence of work-related skills, experiences and professional development;
- **My Journals** tab to create, share, manage and collaborate using reflective journals on any topic;
- **My Networks** tab to
  - create, share and manage evidence of achievements gained through clubs and networks;
  - see an overview of those who are invited to view, provide feedback or collaborate (as well as those who have requested them to provide feedback);
  - access exemplar portfolios;
  - see a comparison of their self-ratings with an average of others’ ratings of their achievements;
- **My Showcases** tab to create, share and manage polished evidence of learning and publish showcases to Curtin’s iTunes U site.

**Figure 5**: The iPortfolio’s Evidence Manager (on right) is used to tag evidence with the Graduate Attributes and the Triple-i curriculum

Owners of iPortfolios can upload evidence in a variety of file formats (including Portable Document Format, text, image, movie and audio) that can be tagged with the Graduate Attributes and Triple-i Curriculum. In the Figure 5, an example iPortfolio for a
multimedia design student shows the blue Evidence Manager Panel. The iPortfolio owner uses this Panel to upload and tag evidence of learning and attainment of the graduate attributes and Triple-i curriculum experiences. The Tag Cloud shows, in larger font, tags used more frequently. Perhaps more significantly, the About Me presentation space includes a My Rating tab (see Figure 6) that enables iPortfolio owners to self-assess their attainment of the Graduate Attributes and the Triple-i Curriculum.

Figure 6: the My Ratings Page enables the owner to collate all evidence and reflections against the Graduate Attributes and Triple-i curriculum

The My Rating space uses a five-star rating system in conjunction with a critical reflection for each Graduate Attribute: the five star-rating system is based on Dreyfus and Dreyfus’ Five-Stage Model of Adult Skill Acquisition (Dreyfus, 2004):

| * | Novice | You know and try to follow the basic rules and get as much information and experience as you can. You are tentative in making any decisions or deciding |
The owner’s reflection is accompanied with evidence that, when taken together, justify the star rating for the given attribute. An Action Plan is encouraged: the iPortfolio owner can establish a strategy for making further progress towards attainment of the Graduate Attributes and the Triple-i Curriculum. The iPortfolio owner can invite feedback on their My Rating space from peers, employers, academic mentors, or teaching staff. These will undoubtedly also have suggestions on how attainment might be enhanced. In an employability context, it should also be easier for students to “think on their feet” during job interviews if they have reflected on Graduate Attribute attainment and employability skills in their iPortfolio, and previously received feedback on this from peer and mentor communities.

The My Rating facility potentially provides a further data set for the 360 degree perspective captured in the Needs Analysis for Comprehensive Course Review. This facilitates the triangulation of student, graduate and employer perceptions from existing tools with a new source of aggregated data that incorporates students’ perceptions of their achievement from the iPortfolio. A further potential use of the My Rating space is a channel for the iPortfolio owner to provide feedback on what has helped or hindered their attainment of the Graduate Attributes and the Triple-i Curriculum so far in their course experience.

### Stakeholders and Communities and Social Networks

As stated previously, the iPortfolio seeks to be strategically aligned with other quality teaching and learning initiatives, particularly Comprehensive Course Review. The Curriculum Map documents (as discussed above) where teaching teams intend that the Graduate Attributes are contextualised and assessed within a degree program. The Needs Analysis communicates stakeholder perceptions of attainment of learning outcomes. To
complement this process, the iPortfolio is designed to provide a sophisticated means of closing the loop on Graduate Attribute and Triple-i Curriculum attainment, and provide a way for students to communicate this with other stakeholders such as peers with iPortfolios; university communities in which the iPortfolio owner participates; accrediting bodies, professional societies, local industry; potential employers; and the wider global community. The iPortfolio seeks to accommodate the interests of these stakeholder communities, while also preserving the rights and privacy of individual iPortfolio owners who will be able to create multiple presentations, but restrict the viewing of each to specified individuals or groups. This is the key link with graduate employability.

However, beyond being able to publish an on-line resume or simple archive of learning artefacts, the iPortfolio is designed to capitalise on students’ social networking behaviours; it incorporates Web 2.0 and Social Networking features to facilitate improved communication and interaction between iPortfolio owners and other stakeholders. This is particularly emphasised in the My Networks tab where the owner can include volunteer organizations, student clubs and departments, peer mentor groups, and university committees and organizations. Feedback from peers on these reflections can reinforce or clarify peer perceptions regarding one’s contributions of knowledge and skills. A goal is to highlight participation that is deemed to be of value by the community, particularly with respect to employability skills that can be leveraged in both academic and extracurricular contexts.

Summary, Conclusions and Implications

The Curtin iPortfolio has a strong focus on graduate employability, with an emphasis on Curtin’s Graduate Attributes and the Triple-i Curriculum. The goal is to close the loop on Comprehensive Course Review by incorporating data associated with students reflecting on and providing evidence of their achievements. This is done by designing a strong focus on job readiness, global citizenship, and interdisciplinary experiences into all Curtin courses and into the iPortfolio structure. The iPortfolio intends to create a learning space that is both lifewide and lifelong. The iPortfolio encourages lifewide learning, recognising that life experience and extracurricular activities can differentiate students from others who have completed similar degrees, and are themselves a rich source of Triple-i Curriculum experiences. Through the iPortfolio, students are encouraged to participate in university life outside the classroom, reflect on what they contribute to these communities, and what they
have learned as a result of their participation in them. Feedback from peers and others is also a key component of the social learning experience built into the iPortfolio.

It is envisaged that when the iPortfolio system is fully implemented in early 2010, it will be possible to build the lifelong component: to extend ownership to alumni as well as potentially to prospective students. The 2008 Review of Australian Higher Education, commonly known as the Bradley Review, indicated that “there should be trials of alternative approaches to the selection of students which use a broader range of criteria, in addition to, or replacing tertiary entrance scores (TER) and which recognise structural disadvantage” (Bradley, Noonan, Nugent, & Scales, 2008). The iPortfolio is one potential approach to this. That is, prospective students could be invited to create an iPortfolio as part of their application for University admission. Extending the iPortfolio to alumni is a means of maintaining ongoing ties between graduates and the University. The aim is to enhance student learning outcomes, and confidence in their achievements, and support them as emerging professionals and contributing citizens.

References
Hare, J 2008, ‘Curtin Triples the i-Factor’, Campus Review, Curtin University, Perth.

Oliver, B & Ferns, S 2009, ‘Comprehensive Course Review to Ensure Student Achievement of Curtin’s Graduate Attribute’, poster presented at the National GAP Symposium, Perth.


E-portfolios - Managing Learner Information in the vocational education and training sector

Allison Miller
Australian Flexible Learning Framework

Abstract

The use of information and communication technologies (ICT) in learning and assessment provides opportunities for 21st century learner centred pedagogical practices. Emerging technology such as electric portfolios (e-portfolios) are enabling new ways of accessing, undertaking as well as documenting formal and informal learning experiences. As learner driven collections of digital information, e-portfolios provide learners with a means of managing evidences of their capabilities and learning achievements.

The national training system’s e-learning strategy, the Australian Flexible Learning Framework’s (Framework) E-portfolios business activity (E-portfolios) is working towards establishing a national standards-based approach to the use of e-portfolio technologies for managing learner information in the vocational education and training (VET) sector.

In its initial year (2008), E-portfolios undertook research and consultation to establish a strategic roadmap, and investigate the:

- requirements for managing learner information when using e-portfolios;
- the potential of trust networks;
- As well an environmental scan of the use of e-portfolios to support RPL (recognition of prior learning) for VET.

1 http://www.flexiblelearning.net.au
The establishment of the E-portfolios Reference Group (ERG) and the VET E-portfolios Community of Practice\textsuperscript{2} has helped raise awareness and support for good e-portfolio practice.

The resultant infrastructure and policy developed from this activity will help ensure portability of learners’ collected evidence to support transitioning between education and training organisations, jurisdictions, and between employers and industries. The move to e-portfolios in VET supports a number of national and local policy objectives.

Keyword:

Introduction

Living and working in the knowledge era means people expect to use technology to support learning in the same way they use it in their everyday lives. Australian education and training organisations are realising the key benefits of incorporating information and communication technologies (ICT) and the internet into flexible learning opportunities. This comes with the need for increased digital literacy skills. These influences have given rise to a growing interest in the adoption and use of electronic portfolios (e-portfolios) in the vocational education and training (VET) sector.

In 2005, the national training system’s e-learning strategy, the Australian Flexible Learning Framework (Framework) identified the need to support learner mobility and lifelong learning through e-portfolio use, and since that time has commissioned various research papers (see Literature Review below).

In 2008, the Framework established the E-portfolios - Managing Learner Information\textsuperscript{3} (E-portfolios) business activity. This business activity is working towards a national standards-based approach to the use of e-portfolio technologies for managing learner information in the VET sector.

In its initial year (2008), E-portfolios began laying the foundation in gaining national agreement on standards for e-portfolio systems. These national standards will enable compatible services and information formats to integrate with existing online learning systems and will provide national guidelines, functional specifications and strategies for embedding e-portfolios in the VET sector.

\textsuperscript{2} http://www.flexiblelearning.net.au/content/vet-e-portfolios-community-practice

\textsuperscript{3} http://flexiblelearning.net.au/e-portfolios
The resultant infrastructure will ensure portability of learners’ collected evidence of learning to support their ability to move between training and other forms of education, between jurisdictions, and between employers and industries. This work supports the demand for changes to current practice and policy in VET and provides the groundwork for further research.

Literature Review

This article describes the work and outputs of E-portfolios during 2008. This includes the identification of technical standards, interoperability and policy areas for implementation e-portfolios in the VET sector. This work was scoped from the research and recommendations previously published by the Framework:

- Developing e-portfolios for VET: Policy issues and interoperability\(^4\), 2007 – which documents an environmental scan of e-portfolio use relevant to the national training system.

- Processes, systems and tools supporting recognition of prior learning survey\(^5\), 2007 – which documents Recognition of Prior Learning (RPL) and recognition of current competency (RCC) systems and tools being used throughout the Australian training system, including e-portfolios.

- Sustaining the Momentum – Directions for Interoperability in the VET Sector\(^6\), 2005 – which details strategic approaches to interoperability, and identifies areas in which the scope or e-standards should be broadened.

- At the time of scoping E-portfolios work in 2008, a number of national and international documents and the work of several organisations were drawn upon to determine the ways e-portfolios support lifelong learning. These included:

- Effective Practice with e-Portfolios – Supporting 21st century learning\(^7\), JISC, 2008 - which investigates current good e-portfolio practice for teaching and learning and as an aid to progressing through the various stages of education and employment.

- E-Portfolio use by university students in Australia: informing excellence in policy and practice\(^8\), Australian e-Portfolio Project, 2008 – funded by the Australian Learning

\(^4\) http://e-standards.flexiblelearning.net.au/docs/vet-eportfolio-report-v1-0.pdf
\(^5\) http://e-standards.flexiblelearning.net.au/news-older-items.htm#a7
\(^6\) http://e-standards.flexiblelearning.net.au/news-older-items.htm#a1
\(^7\) http://www.jisc.ac.uk/whatwedo/programmes/elearning/eportfolios/effectivepracticeeportfolios
and Teaching Council (ALTC), this report analyses e-portfolio use in the higher education sector and provides guidance on future development opportunities.

- IMS e-Portfolio Best Practice and Implementation Guide\(^9\), IMS Global Learning Consortium, 2005 - describes the rationale for interoperable e-portfolio technical specifications, the major types of e-Portfolios being used internationally as well as use cases and examples

- Organisations and Communities of Practices which support the embedding of e-portfolio for lifelong learning, including:
  - Centre for International e-Portfolio Development\(^10\)
  - European Institute for E-learning (EIfEL)\(^11\)
  - SURF NL\(^12\)
  - Centre for Recording Achievement\(^13\)

The above sited work indicate that e-portfolios provide a structured way of recording learning experiences and work history to support transition points, including:
- transitions into and between educational sectors
- transitioning from formal education and training into employment
- career transitions, including promotions, up skilling, redundancy, job reclassifications and job appraisals

**Methodology**

This paper is written by the E-portfolios Business Manager, Allison Miller, with the intention of providing an insight and overview of the research undertaken by E-portfolios in 2008 and the resultant outputs. This paper is based on a presentation by the E-portfolios Business Manager at the Australian e-Portfolio Symposium 2 at Queensland University of Technology in February 2009.

The E-portfolios Business Manager worked closely with the E-standards for Training\(^14\) Business Manager, Owen O'Neill, and the E-portfolios Reference Group (ERG) to

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9 [http://www.imsglobal.org/ep/epv1p0/imsep_bestv1p0.html](http://www.imsglobal.org/ep/epv1p0/imsep_bestv1p0.html)
10 [http://www.nottingham.ac.uk/eportfolio/index.shtml](http://www.nottingham.ac.uk/eportfolio/index.shtml)
12 [http://www.surf.nl/en/Pages/home.aspx](http://www.surf.nl/en/Pages/home.aspx)
14 [http://e-standards.flexiblelearning.net.au/](http://e-standards.flexiblelearning.net.au/)
scope the 2008 E-portfolios research briefs. She worked collaboratively with the 2008 researchers to develop key stakeholder consultation lists, desktop research and literature reviews lists as well as developing the final outputs of the 2008 research work.

The E-portfolios research work and outputs referenced in this paper consists of the work of a variety of ‘expert’ researchers and writers, engaged through a competitive, tender process. The research and relevant outputs were derived from analysis and findings based on both desktop research and consultation with key stakeholders.

Information sourced for the desktop research are listed in the bibliographies of the relevant reports mentioned within, and are available from the List of Websites (page 10) and References (page 12).

Stakeholders consulted comprised of educational leaders, managers\(^{15}\) and consumers\(^{16}\) of learner information, ICT, RPL and e-portfolio experts, policy and government representatives, e-portfolio implementers and developers, together with international researchers.

### Setting the Scene for e-portfolios in the VET sector

The Australian VET sector, a nationally accredited training system made up of public and private registered training organisations (RTOs), is designed to skill workers and provides pathways to further education. VET is underpinned by the Australian Quality Framework\(^{17}\) (AQF), consisting of nationally recognised training packages and is governed by the Australian Quality Training Framework\(^{18}\) (AQTF). VET qualifications range from Certificate I through to Graduate Diplomas.

The Framework is the VET sector’s e-learning strategy, funded by the jurisdictions and Australian Government, and is managed by the Flexible Learning Advisory Group (FLAG)\(^{19}\). FLAG is an advisory group of the National Senior Officials Committee (NSOC), established in 1996. FLAG provides key policy advice on national issues related to the directions and priorities for the application of ICT in VET and adult and community education (ACE).

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\(^{15}\) People within a registered training organisation who are responsible for the information held about students such as ICT and administrative support personnel, ICT and educational managers.

\(^{16}\) Organisations and/or individuals requiring the formal verification of a learner’s qualification ie employers, occupational licensing bodies, recruitment agencies, professional associations and tertiary admission centres

\(^{17}\) [http://www.aqf.edu.au/](http://www.aqf.edu.au/)


\(^{19}\) [http://www.flag.edu.au/](http://www.flag.edu.au/)
The Framework is in its third iteration (2008-2011 Australian Flexible Learning Framework Strategy\textsuperscript{20}) and operates through two interconnecting programs, the Leadership Program and the Innovation Program. Current Framework business objectives focuses on:

- building on essential e-learning infrastructure;
- investing in business-training provider partnerships; and
- investing in empowering learners;

The Leadership Program provides the essential infrastructure (services, standards and resources) as the foundation and catalyst for sustainable e-learning. It is managed through nationally focused activities, like LORN, Flexible Learning Toolboxes, Benchmarking & Research, and E-standards for Training\textsuperscript{21}

The Innovation Program supports and enables innovation so that e-learning is an integral part of the national training system. The E-learning Innovations business activity is decentralised and is managed by each of the states/territories, while the E-learning for Industry\textsuperscript{22} business activity has a national focus.

E-portfolios sits within the Leadership Program and aims to develop a sector wide approach to technical standards, business rules and policy for e-portfolio use. This national approach will enable portability of learner evidence between jurisdictions, education and training organisations and employment.

E-portfolios is guided by the ERG. ERG has a wide membership base, consisting of e-portfolio, RPL and technical standards leaders, together with cross sector representations from schools, ACE and higher education, as well as representatives from the Australian Government Department of Education, Employment and Workplace Relations (DEEWR) and industry.

To raise awareness and disseminate E-portfolios outcomes, the VET E-portfolios Community of Practice facilitates a range of activities, including the E-portfolios blog\textsuperscript{23}, presentations at conferences, organisational consultations and participation in other E-portfolio Communities of Practice.

The 2008 E-portfolios research activities include:

- VET E-portfolio Roadmap

\textsuperscript{20} http://www.flag.edu.au/content/2008-2011-framework-strategy
\textsuperscript{21} http://industry.flexiblelearning.net.au/
\textsuperscript{22} http://flexiblelearning.net.au/e-portfoliosblog
- RPL support system investigation and trial
- Learner information security investigation
- VET trust federation analysis

Each of these activities is described in more detail below:

**VET E-Portfolio Roadmap**

Extensive research together with national and international stakeholder consultation resulted in the VET E-portfolio Roadmap (Roadmap). The Roadmap is a national strategic plan designed to support the diverse requirements for e-portfolios in the VET sector.

The Roadmap has established a generic e-framework reference model for a “VET e-portfolio system and related services”. This e-framework describes the commonly required features of an e-portfolio system to meet the needs of the VET sector. This in turn provided the structure for establishing a Roadmap for VET e-portfolio activity, giving rise to nine national goals and three key outputs:

<table>
<thead>
<tr>
<th>9 National Goals</th>
<th>Key Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Portability</td>
<td>Output 1: National guidelines for VET managers of learner information</td>
</tr>
<tr>
<td>Goal 2: Verification</td>
<td>Output 2: Functional specifications for e-portfolio system developers and implementers</td>
</tr>
<tr>
<td>Goal 3: Privacy</td>
<td>Output 3: Strategies for embedding e-portfolios into VET</td>
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<tr>
<td>Goal 4: Ownership</td>
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<td>Goal 5: Access control</td>
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<td>Goal 6: Infrastructure</td>
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<td>Goal 7: Storage</td>
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<td>Goal 8: Embedding</td>
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<tr>
<td>Goal 9: Transitions</td>
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</tbody>
</table>

**Table 1: The VET E-portfolio Roadmap - National Goals and Key Outputs**

The Roadmap has been endorsed by all of the states and territories through FLAG and through the E-standards Expert Group (EEG), the committee authorised by NSOC to review and ratify national technical standards for the sector.
RPL Support System Investigation and Trial

This research investigated the use of e-portfolio systems to support the gaining of formal recognition of existing skills through RPL processes in the VET sector. A researcher led consultative process, was supported by two commissioned trials involving Adult Learning Australia (ALA) and Brisbane North Institute of TAFE (BNIT) and resulted in the E-portfolios for RPL Assessment\(^24\) report.

Key findings of this report include:

- Digital evidence can be easily captured, uploaded, organised and identified on a dynamic and ongoing basis within an e-portfolio environment.
- E-portfolios support ongoing dialogue between RPL candidates and assessors, allowing assessors to view and provide advice on evidence as it is generated.
- E-portfolios are particularly useful where geographical or time differences prohibit face-to-face or real-time communication or validation of evidence.
- E-portfolios have many benefits beyond the RPL process, including: building a skills profile; supporting identified gap training; and managing workplace performance, through recognising, rewarding and reclassifying employees.

A summary of the recommendations of this report include:

- the need for more collaboration between E-portfolios and with the Council of Australian Governments (COAG) RPL initiative\(^25\)
- Determining the business drivers behind RPL and the continued use of an e-portfolio beyond the RPL process.
- Investigating the benefits of generating ‘live’ workplace or work ready evidence, through capturing an individual’s job tasks via audio recording, video recording or point of view devices\(^26\).
- Providing professional development and support resources to enable e-portfolio usage in the RPL process.

This research identified e-portfolios provide an effective mechanism to support COAG’s RPL initiative, aimed at building RPL quality and good practice for VET.

\(^24\) The E-portfolios for RPL Assessment is available at: [http://www.flexiblelearning.net.au/content/e-portfolios-resources](http://www.flexiblelearning.net.au/content/e-portfolios-resources)


\(^26\) [http://www.edupov.com/](http://www.edupov.com/)
Learner information security investigation

This investigation identified the key areas to be addressed by managers of learner information in relation to e-portfolio use in the VET sector.

This research resulted in the Managing Learner Information: Important consideration for implementing e-portfolio in VET\(^\text{27}\) report. Key points of discussion include: ownership, privacy, verification and security of learner information.

This report considered:

- the need to establish a technical definition of “learner” for the VET sector through the identification of the common technical learner attributes
- E-portfolio service provider\(^\text{28}\) use cases for Australia
- content types likely to be managed by an e-portfolio system, together with implementation considerations which apply

The report recommends that E-portfolios seek to gain a whole of education and training approach to e-portfolios through the work of the Australian Information and Communication Technology in Education Committee (AICTEC) to:

- Establish a technical definition of ‘learner’ for the VET sector
- Develop generic resources which outline the legal requirements for privacy and ownership of data related to e-portfolios
- Investigate existing qualification verification services and systems to determine their potential integration with VET e-portfolio systems
- Identify the business drivers for establishing a trust federation for the VET sector.

This work identified that further research in this area will enable efficiencies in e-portfolio uses to effectively support learner mobility as they move between educational sectors, job roles and industry areas.

VET Trust Federation Analysis

This study aimed to identify and evaluate the potential applications of the Australian Access Federation (AAF) for the national training system. The study resulted in a Discussion Paper: Towards a VET trust network\(^\text{29}\).

\(^{27}\) The Managing Learner Information Report is available at: \text{http://www.flexiblelearning.net.au/content/e-portfolios-resources}

\(^{28}\) An organisation who hosts a e-portfolio system

\(^{29}\) \text{http://e-standards.flexiblelearning.net.au/docs/vet-trust-federation-paper-v1-0.doc}
This discussion paper explains the concept of a trust network (or federation) by providing examples of trust federations and details potential applications and policy considerations for VET use cases.

This discussion paper has been endorsed by FLAG and concludes that it is timely for further work to be undertaken to determine the key drivers for a VET trust federation, and the requirements for such a federation for VET.

**Current E-portfolio Activity in the VET Sector**

Current e-portfolio activity in the VET sector is limited but building momentum. To date, the Framework has identified a number of examples of e-portfolio use in the VET sector, including:

- Supporting the RPL process, (see case studies in the E-portfolios for RPL Assessment Report)
- Enabling reflective practice in competency based training ie Rosny College’s (TAS) VET in Schools Outdoor Education learners, and with trade apprentices at Swan TAFE (WA)
- Managing multimedia artefacts and the integration of web 2.0 services ie Charles Darwin University (NT) VET multimedia learners
- Capturing on-the-job assessment or ‘live’ evidence through point of view devices i.e. Tasmania’s Polytechnic trade apprentices (TAS)
- Supporting the development of employability skills ie Swinburne TAFE (VIC)
- Developing the skills of self-promotion to enable learners to gain employment or apply for future education and training ie Wodonga TAFE (VIC)
- Helping learners manage their learning outputs ie school based Community Services learners at Canberra Institute of TAFE (ACT).

The Framework will continue to commission trials to investigate the use of an e-portfolio, and is interested in hearing from RTOs who are currently using or planning on using e-portfolios, so their stories can be shared and linkages provided through the VET E-portfolio Community of Practice.
E-portfolios Enable VET Policy and Practice

The E-portfolios work undertaken in 2008 aimed at addressing a number of local and national demands on RTOs, including the COAG RPL initiative and addressing industry skills shortages.

The introduction of Employability Skills\(^\text{30}\) into all new and revised training packages is aimed at supporting increased human capital. Assessment and reporting of Employability Skills in training packages\(^\text{31}\) by The Allen Consulting Group (2006) recognised that these transferable skills can effectively be achieved through both formal and informal processes. The report also suggests that e-portfolios provide an effective means of demonstrating Employability Skills through the capture of digital evidences and managed through an e-portfolio.

Other broader policy contexts that have relevance for E-portfolios’ activities include:

- Quality learner-centred practices in education and training, as well as national and cross sectoral approaches to ICT infrastructure development, (Digital Education Revolution\(^\text{32}\) (DER))
- Improved transition processes between VET and higher education (Bradley, Review of Australian Higher Education Report\(^\text{33}\))
- Verification, portability, privacy and interoperability of learner data (Learner Identity Management Framework (LIMF)\(^\text{34}\), National VET Data Strategy\(^\text{35}\))
- Improved digital literacy skills to manage smart cards, identity management, privacy and the ‘packaging’ of personal profiles in other sectors (such as medical records in the Health sector\(^\text{36}\), and the use of social media to engage with citizens such as the work by the Government 2.0 Taskforce\(^\text{37}\))

\(^{30}\) Employability skills are also sometimes referred to as generic skills, capabilities, enabling skills or key competencies - [http://www.dest.gov.au/sectors/training_skills/policy_issues_reviews/key_issues/es/](http://www.dest.gov.au/sectors/training_skills/policy_issues_reviews/key_issues/es/)


\(^{34}\) [http://www.aictec.edu.au/aictec/go/home/about/cache/offhome/pid/171](http://www.aictec.edu.au/aictec/go/home/about/cache/offhome/pid/171)


\(^{37}\) [http://gov2.net.au/](http://gov2.net.au/)
The future for e-portfolios in VET – where to from here:

This paper describes the work being under by E-portfolios around the use of e-portfolios in the VET sector. This work recognises that there are diverse and valid purposes and user requirements for e-portfolios in VET. In order to meet the needs of an ever changing labour market, e-portfolios provide the national training system with the means to enable 21st century learner centred pedagogies.

This work will be complemented by further investigative research and trials managed by E-portfolios to:

- provide national infrastructure, technical standards, policy and business rules required to enable learner controlled e-portfolios to support lifelong learning transitions, as outlined in the VET E-portfolios Roadmap
- determine the requirements for protecting and verifying learner information associated with e-portfolios, and build upon the research undertaken for the Managing Learner Information report
- identify the factors that contribute to the successful implementation of an e-portfolio system to support the recognition of existing skills, as recommended in the E-portfolios for RPL Assessment report
- collaborate with the Framework’s E-standards for Training team to determine the business drivers for a VET trust network, as proposed in the Discussion Paper: Towards a trust federation for VET, and
- continue to support RTOs and practitioners develop strategies to embed the use of e-portfolios in VET through the VET E-portfolio Community of Practice.

The work being undertaken by E-portfolios enables the use of e-portfolios to support industry demands for more flexible training and assessment opportunities. Emerging technologies like e-portfolios support COAG initiatives to empower individuals to plan and control their own learning whilst increasing opportunities to gain recognition of existing skills and knowledge. These activities are also enabling individuals to develop the digital literacy skills to be an effective 21st century citizens.
**List of Websites**

<table>
<thead>
<tr>
<th>No</th>
<th>Website</th>
<th>Address</th>
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<td>Australian Flexible Learning Framework</td>
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<tr>
<td>5</td>
<td>Communities of Practices which support the embedding of e-portfolio to support lifelong learning, including:</td>
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<tr>
<td>5.a</td>
<td>Centre for International ePortfolio Development</td>
<td><a href="http://www.nottingham.ac.uk/eportfolio/index.shtml">http://www.nottingham.ac.uk/eportfolio/index.shtml</a></td>
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<td>Centre for Recording Achievement</td>
<td><a href="http://www.recordingachievement.org/">http://www.recordingachievement.org/</a></td>
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<td>5.c</td>
<td>European Institute for E-learning (EiFEI)</td>
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<td>Educational Point of View (EDUPOV)</td>
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<td>9</td>
<td>Effective Practice with e-Portfolios – Supporting 21st century learning</td>
<td><a href="http://www.jisc.ac.uk/whatwedo/programmes/elearning/eportfolios/effectivepracticeeportfolios">http://www.jisc.ac.uk/whatwedo/programmes/elearning/eportfolios/effectivepracticeeportfolios</a></td>
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<td>10</td>
<td>E-learning for Industry business activity</td>
<td><a href="http://industry.flexiblelearning.net.au/">http://industry.flexiblelearning.net.au/</a></td>
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<td>E-portfolios business activity</td>
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<td>13</td>
<td>E-portfolios for RPL Assessment report</td>
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<td>Government 2.0 Taskforce</td>
<td><a href="http://gov2.net.au/">http://gov2.net.au/</a></td>
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<td>16</td>
<td>IMS ePortfolio Best Practice and Implementation Guide</td>
<td><a href="http://www.imsglobal.org/ep/epv1p0/imsep_bestv1p0.htm">http://www.imsglobal.org/ep/epv1p0/imsep_bestv1p0.htm</a></td>
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<td>17</td>
<td>Learner Identity Management Framework (LIMF)</td>
<td><a href="http://www.aictec.edu.au/aictec/go/home/about/cache/ofence/pid/171">http://www.aictec.edu.au/aictec/go/home/about/cache/ofence/pid/171</a></td>
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<td>Managing Learner Information – Important consideration for implementing e-portfolio in VET report</td>
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<td>20</td>
<td>Processes, systems and tools supporting recognition of prior learning survey</td>
<td><a href="http://e-standards.flexiblelearning.net.au/news-older-items.htm#a7">http://e-standards.flexiblelearning.net.au/news-older-items.htm#a7</a></td>
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<td>21</td>
<td>Sustaining the Momentum – Directions for Interoperability in the VET Sector</td>
<td><a href="http://e-standards.flexiblelearning.net.au/news-older-items.htm#a1">http://e-standards.flexiblelearning.net.au/news-older-items.htm#a1</a></td>
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<tr>
<td>22</td>
<td>Towards a VET trust federation discussion paper</td>
<td><a href="http://e-standards.flexiblelearning.net.au/docs/vet-trust-federation-paper-v1-0.doc">http://e-standards.flexiblelearning.net.au/docs/vet-trust-federation-paper-v1-0.doc</a></td>
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<td>23</td>
<td>VET E-portfolio Roadmap</td>
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<td>VET E-portfolios Community of Practice</td>
<td><a href="http://www.flexiblelearning.net.au/content/vet-e-portfolios-community-practice">http://www.flexiblelearning.net.au/content/vet-e-portfolios-community-practice</a></td>
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</table>

**References**


IMS ePortfolio Best Practice and Implementation Guide 2005, *IMS Global Learning Consortium*, [http://www.imsglobal.org/ep/epv1p0/imsep_bestv1p0.html](http://www.imsglobal.org/ep/epv1p0/imsep_bestv1p0.html).


Building Communities of Practice for e-Portfolio Implementation: An Initial Approach by Two Australian Institutions

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Abstract

The Australian e-Portfolio Project 2008 report confirmed that most Australian institutions are in the early stages of adopting e-Portfolio concepts to support University-level learning. The report recommended steps to systematically address the disparate approaches restricting e-Portfolio implementation that currently exist in the Higher Education sector. This included building an ongoing Community of Practice with key stakeholders.

This paper outlines the design approach when implementing e-Portfolios taken by two Australian institutions in responding to the concept to develop communities of practice. A case study approach provides experiences of The University of South Australia (UniSA) and RMIT University (RMIT) to illustrate the design outcomes of their e-Portfolio collaboration across discipline areas, information technology, and teaching and learning support areas. Initial impressions are stated regarding the synergistic benefits attained from identifying and linking collaborative priorities, including the expectation of increased resource availability and faster implementation times.

The paper also includes an overview of the collaborative path currently being undertaken by the two institutions across 2009 in relation to e-Portfolio concepts. This is
useful to assist other Universities with prioritisation of collaborative actions. It should be noted that the authors presented aspects of this paper at the 2009 Australian e-Portfolio Symposium held in Brisbane in February, and have authored a non-refereed paper on our collaboration presented at EDUCAUSE, May 2009, Perth, Australia. We thank reviewers for their comments.

Keywords:

Introduction

A recent trend in education is the implementation of e-Portfolios for educative purposes. This is often supported by a top-down approach to deliver benefits for society and its members. Europe has a vision of an ‘e-Portfolio for all by 2010’ (European Institute for E-Learning, 2007) and in the United Kingdom national policy and lifelong learning initiatives have driven the uptake of e-Portfolios (Department for Education and Skills, 2005) in relation to both personal and professional identities.

In 2007, the Australian Learning and Teaching Council (ALTC) commissioned the Australian e-Portfolio Project to compile a report on e-Portfolios in Australia. It was titled ‘e-Portfolio use by university students in Australia: Informing excellence in policy and practice’ (AeP, 2008). The final report provided a valuable overview of e-Portfolio contexts both within Australia and internationally. Key findings identified were (AeP, 2008):

- A high level of interest in the use of e-Portfolios. Almost one third of delegates to the Australian e-Portfolio 2008 Symposium were from institutions not yet using e-Portfolios and showed strong interest in learning about the tools available.
- A fragmented approach within Australian Universities. E-Portfolio practice within Australia appeared ad hoc and patchwork in nature with many institutions making initial explorations.
- A gap between current practice in Australia and leading edge practice in other countries.
- The need for open dialogue and effective collaboration between stakeholders.
In 2009, the ALTC provided further funding for AeP2 with one of the aims to establish, facilitate and encourage an Australian Community of Practice for e-Portfolio researchers and practitioners (AeP2, 2009).

What is an e-Portfolio?

The term e-Portfolio commonly refers to an electronic tool that supports the same purpose, pedagogical, and assessment concepts inherent in paper-based portfolios. It has been defined as (Sutherland and Powell, 2007):

“A purposeful aggregation of digital items – ideas, evidence, reflections, feedback etc., which ‘presents’ a selected audience with evidence of a person's learning and/or ability”.

Why Have an e-Portfolio?

There are many potential benefits from implementing e-Portfolios. These include:

- to increase both student engagement and retention (Yancey, 2009; Piper et al., 1999 cited in Stansberry and Kymes, 2007).
- an aid to developing reflective skills, with value as a means of developing transferable skills (Roberts et al., 2005).
- an opportunity to change ‘from assessment of learning to assessment for learning’ (Barrett and Carney, 2005).
- to assist with a holistic approach to learning (AeP, 2008) transforming a series of unrelated courses into interconnected learning experiences (Indiana University, 2009).
- to offer the potential for individuals to add further or richer data to the formal institutional transcript (AeP, 2008) by providing a mechanism for identity development and contextualising learning. This may help to overcome current employer concerns with university graduates (A.C. Nielsen Research Services, 2000, Precision Consultancy, 2007) by aiding the development, articulation and evidencing of employability attributes.
- to assist disciplines to support individuals in developing and evidencing professional competencies and attributes (McAllister et al., 2008, Butler, 2006).
- to increase student mobility between universities and countries (JISC, 2008a).
• to provide alternative entry pathways with relevant prior learning evidenced in a suitable format for consideration (JISC, 2007b, JISC, 2007a).

Key Factors In Successful e-Portfolio Implementation

Overseas research has demonstrated sufficient benefits are conferred by e-Portfolios to warrant institutional investment (JISC, 2008c). The application of e-Portfolio concepts within a learning environment is now well established, particularly within Europe, the United States of America (USA) and Canada (AeP, 2008, Barker, 2006, Ravet, 2005, Roberts et al., 2005, Cambridge, 2004, Grant et al., 2004).

Challenges identified for successful e-Portfolio implementation include a number of areas that require consideration: (Philip et al., 2007 cited in AeP, 2008):

• the need for financial support
• academic time poverty
• the need for well-placed institutional champions
• difficulty in identifying and quantifying ‘communities of practice’ outcomes
• the sustainability and ongoing support of e-Portfolios

In addition to these, there are factors specific to e-Portfolio implementation to pay attention to:

• Linking research and practice, with the Australian Learning and Teaching Council anticipated to play a vital role in facilitating this form of collaborative research (Hallam and Harper, 2008, AeP, 2008).
• Identifying pedagogical needs prior to selecting an e-Portfolio tool (JISC, 2008c, Whitelock et al., 2005, AeP, 2008, Hughes, 2008). This includes flexibility for the different maturity levels of individuals and disciplines in terms of e-Portfolio use.
• Appointing ‘link staff’ to coordinate activities and ‘to cascade understanding and commitment for Professional Development Planning’ (Cosh, 2008).
• Articulating the philosophy underpinning e-Portfolios to focus discussions on learning outcomes rather than the technology and its management (Batson and Chen, 2008 cited in AeP, 2008).
• Providing assessment of and for learning (Barrett and Carney, 2005) and avoiding taking a purely institutional perspective of e-Portfolio (Barrett and Wilkerson, 2004).
• Enabling multiple e-Portfolios to be created by individuals, each tailored for a specific audience for an explicit purpose, that draw upon a much larger pool of evidence.
(Sutherland, 2007). It is important for learners to retain the ability to show an integrated identity (Cambridge 2008).

- Embedding career planning activities across a program for selecting, reviewing and reflecting processes to build self-awareness and self-confidence when seeking employment (Temple et al., 2003 cited in AeP, 2008).
- Providing interoperability with systems outside the originating institution, with a number of projects aiming to improve the portability of e-Portfolio resources (JISC, 2008b).

**What is a Community of Practice (CoP)?**

Based on situated learning theory, CoP originated in 1991, incorporating knowledge gained outside of formal structures (Lave and Wenger, 1991). CoPs differ from other social groups due to their shared interest, a focus on practice and conscious nurturing by members of the CoP (Lave and Wenger, 1991 cited in Green et al., 2009). Wenger outlined indicators of practice and listed three dimensions between practice and community: joint enterprise, mutual engagement and shared repertoire (Wenger 1998). Steps to build a knowledge strategy based on CoP in the workplace are also provided (Wenger 2000).

For more than twenty years, the concept of Communities of Practice (CoP) have been embraced by the Education sector (Li et al., 2009). CoP activities are considered fundamental to tertiary institutions with communities an integral part of academic work and often include members across institutions (Churchman and Stehlik 2005). Accordingly, CoPs are seen as useful for e-Portfolio implementation in Australian educational contexts (Botterill et al., 2008, Hallam et al., 2008 Hartnell,-Young and McGuiness 2005).

Wenger equated CoP as a perspective, rather than a theory, that provides guidance on where to direct attention and what difficulties to expect and the approach to take (Wenger 1998 cited in Storberg-Walker 2008). Wenger outlined indicators linked to three domains: joint enterprise, mutual engagement and shared repertoire (Wenger 1998), and later added steps to build a Knowledge strategy based on CoP (Wenger 2000).

Table 1 summarises the areas requiring attention when implementing e-Portfolios, and lists the anticipated value of developing CoP across institutions. The connections made between indicators and domains (Li et al., 2009) are drawn on to note the domains of a CoP anticipated to provide benefits in comparison to existing formal structures. Further
A discussion on CoPs for e-Portfolio implementation, particularly within the Australian context has been published elsewhere (Hallam and Harper, 2008).

<table>
<thead>
<tr>
<th>Implementation Consideration</th>
<th>Value of Inter-University CoPs</th>
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<tbody>
<tr>
<td><strong>Proposed CoP domain (see Li et al, 2009)</strong></td>
<td><strong>Joint enterprise, Mutual engagement</strong></td>
</tr>
<tr>
<td>1. Need for financial support</td>
<td>Sharing resources available</td>
</tr>
<tr>
<td>2. Academic time poverty</td>
<td>Participation optimises limited time available</td>
</tr>
<tr>
<td>3. Need for well-placed institutional champions</td>
<td>The involvement of well-placed champions in one institution can assist similar positions in other institutions to participate or be created</td>
</tr>
<tr>
<td>4. Difficulty of identifying and quantifying communities of practice</td>
<td>Working with another institution can assist to create CoPs, identify membership boundaries, and establish common purposes</td>
</tr>
<tr>
<td>5. Sustainability and ongoing support</td>
<td>Sharing resources can increase sustainability of support and encourage ongoing provision due to the relationship.</td>
</tr>
<tr>
<td>6. Linking of research and practice</td>
<td>Sharing practice and research to increase understanding</td>
</tr>
<tr>
<td>7. Identify pedagogical needs prior to selecting an e-Portfolio tool</td>
<td>Sharing process for identifying needs and evaluating tools</td>
</tr>
<tr>
<td>8. Appointment of ‘link staff’ to coordinate activities and to cascade understanding</td>
<td>Informal CoP provides ‘link staff’ outside formal structures that expands network opportunities</td>
</tr>
<tr>
<td>9. Provision of assessment of and for learning, forming a lifelong learning culture based on student needs</td>
<td>Expanding perspectives of ‘learning’ and challenging existing views when creating resources to support learning</td>
</tr>
</tbody>
</table>
Joint enterprise, Mutual engagement, Shared repertoire

10. Enable multiple e-Portfolios to be created by individuals, whilst retaining the ability to show an integrated identity

Providing exposure to multiple forms of identity due to diversity of membership of CoPs and their learners

Mutual engagement, Shared repertoire

11. Articulate the philosophy underpinning e-Portfolios to focus discussions on learning outcomes

Developing a shared understanding of ePortfolio benefits for learners, professions and institutions

Joint enterprise, Mutual engagement, Shared repertoire

12. Embed career planning activities across the curriculum and increase understanding of employers and professional associations

Expanding member perspective of how connecting learning and employability can develop personal and professional identities at different levels

Joint enterprise, Mutual engagement, Shared repertoire

13. Interoperability of e-Portfolio with systems outside the originating institution

Increasing awareness of multiple identities and their different needs

Joint enterprise, Mutual engagement, Shared repertoire

Table 1: The value identified from supporting e-Portfolio CoPs across two institutions

Methodology

Action Research methodology is often adopted as the research framework for implementation of e-Portfolios (Whitelock et al., 2005, JISC, 2008c). Action research ‘seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities’ (Reason and Bradbury, 2007, p 1). It is an appropriate methodology as it mirrors the underlying philosophy of ePortfolio concepts.
However, inconsistency in CoP terminology and the evolution of its conceptualisation (Cox, 2005) is a concern for research in this area. The literature contains no consensus of a definition of CoP or what to call it (Storberg-Walker, 2008). The use of related terms, such as, Communities of Interest (CoI) adds further complexity, with different interpretations of the term. A CoI can consist of multiple CoPs (Fischer, 2001) or be distinguished from CoPs by their lack of common practice (Wenger, 1998a).

This makes it difficult to identify the stage of development of CoPs. For instance, is a focus on research in cohorts for a period of three years (Inter/National Coalition for Electronic Portfolio Research) a CoP, CoIs or a further evolution of CoPs? The latter would distinguish a focus on purely improving practice to one where research of practice is the focus to increase understanding of underlying concepts, such as engagement with learning.

This paper examines collaboration between two institutions in the early stages of e-Portfolio implementation with the aim to develop a CoP that provide benefits for both practice and research of its members, and their institutions and units.

**Map Key Knowledge Needs**

RMIT have a clear approach to implementing e-Portfolios, this has been published as a case study (Botterill, Allan & Faulkner, 2009). The collaboration between UniSA and RMIT, has as its foundation the e-Portfolio technology platform of PebblePad (Pebble Learning, 2009). Both institutions placed a priority on the adoption of an e-Portfolio technology that was identifiably of high value to learners, and offered the promise of a viable Personal Learning Environment (PLE) with a Web 2.0 look and feel. The PebblePad platform has been adopted for scalable trials at RMIT and University of South Australia. Of importance to both institutions is the presentation of the e-Portfolio system within the overall online student experience.

The use of a common tool designed to support learners (PebblePad) led to discussions between the project managers on the potential to form strategic connections between the institutions to consider many of the issues outlined in Table 1. Both institutions have collaborated previously at the institutional level as partners in the Australian Technology Network (ATN) of universities. This inter-University collaborative model was informed by 'Knowledge Networking' constructs (Seufert et al., 1999), and the understanding that networks of professional expertise both within and between universities are required to overcome the complex issues faced when implementing an effective e-Portfolio system.
The Deputy Vice Chancellors, Academic at both institutions championed the piloting of e-Portfolios to support the implementation of teaching and learning frameworks, and had an expectation that a ground-up collaborative implementation would accelerate the creation of the culture required to support the embedding of e-Portfolio concepts. This was aided by the nomination of staff to oversee each institution’s trial, with communities of practice developed in-house linking the various activities planned.

Rather than taking a top-down approach both universities are exploring the potential of using e-Portfolios concepts with a pilot project in areas where pedagogical or professional needs exist. In 2010 both organisations continue to identify areas to collaborate on the expansion of the PebblePad system as an e-Portfolio.

**Develop and Connect Communities**

Both partners are keen to progress the maturity level of e-Portfolio practices within their institutions with the latest research informing decision making within project. It became apparent that our ability to contribute to the body of knowledge on the implementation of e-Portfolios would be enhanced from our collaborative efforts. We defined actions to establish effective and enduring collaborations to support the advancement of e-Portfolios.

As ATN universities, both have similar discipline areas and student profiles, thereby aiding the identification of shared priority areas for e-Portfolio implementation. Awareness of the disciplines participating in pilot projects led to discussions with corresponding areas, and helped to shape the projects undertaken in order to optimise support and the building of knowledge. All areas for collaboration offer knowledge creation with university-wide benefits.

When identifying potential areas for collaboration in this case study, the prioritised benefits of collaboration for students, academics and institutional management were considered. The areas identified for collaboration cover a wide range of areas of e-Portfolio concepts:

- evaluation of user experiences and achievement of University aims
- career development learning
- maintenance of academic integrity
- promotion of the development of graduate qualities/attributes
- professional accreditation and evidence of learning outside of the university setting
This process was replicated as an exercise as part of our presentation at the Australian e-Portfolio Project Symposium held in Brisbane, February 2009. Participants formed small groups, each taking the perspective of students, academics, or management that were asked to brainstorm priority areas. Discussions confirmed the potential benefit of inter-university collaboration in institution and discipline specific contexts.

Key points have been shared via the ALTC Exchange e-Portfolio Group, these address many of the areas summarised from the literature referenced in brackets from Table 1. Each group noted different aspects when examined through the lens of their particular stakeholder. For instance, the institutional group gave greater attention to the need to secure financial support and to provide interoperability for information systems. This suggests a diverse range of stakeholders in CoPs can assist in the provision of solutions that are sustainable in terms of the ongoing support and benefits that meet the needs of all groups.

The student group identified:

- putting the student first – providing a sense of student control of e-Portfolios (7, 10)
- ensuring professionally relevant - clear understanding of benefit for employers (12)
- providing access to training and support resources (1, 2, 5, 8)
- assessment – clarifying how e-Portfolios are assessed (7, 9, 11)
- benchmarking – standards for equivalence across the sector to aid mobility (10, 12, 13)

The academic group identified:

- staff development exchange networks – more comfortable discussing certain aspects with others outside their organisation (4, 7, 8, 11)
- subject/discipline based networks - form connections with peers that share an understanding of disciplinary and support contexts (3, 8, 10, 12)
- facilitator role of CoP and its importance, plus challenge and discussion on Academic Developer facilitator versus an academic from discipline (3, 4)

The Institutional management group identified:

- the problem/s solved by e-Portfolios for potential collaboration
  - ideas included the transfer of academic credit, enrolment, shared resources, benchmarking, user support and development (1,2,5)
- interoperability of systems and sharing of technical expertise (13)
- learning from others, e.g. use of models to avoid duplication of efforts (3, 5, 6, 8, 11)
- collaboration to access funding to support initiatives (1, 5)
The areas of collaboration identified suggest CoPs offer strategic value to our universities and the sector generally.

**Create Resources to Aid e-Portfolio Implementation**

Both UniSA and RMIT have structured curriculum design to identify and build "Graduate Qualities" (UniSA) and "Graduate Attributes" (RMIT). As part of the collaborative implementation, the universities have explored a common path for the utilisation of e-Portfolios to embed the identified graduate attributes/qualities within the learner's experience. This use of e-Portfolios assists in avoiding the fragmentation of traditional university learning paths, and offers the potential to bring cohesion to the student experience of attaining and recording graduate attributes/qualities and to makes their development explicit. This is an evolution of the UniSA tool Transcript2, developed in 2000 as a record of achievement based on graduate qualities (Department of Education, 2002).

The Profiler function within PebblePad offers a greater level of sophistication than many e-Portfolio systems, as it can provide a listing of structured expectations to which the learner responds. By adapting content in the Profiler to map the relevant Graduate Qualities/Attributes for a specific course, it is then possible to structure the student experience such that, as part of their learning journey, students are evidencing attainments directly against the prescribed Graduate Attributes/Qualities.

Given the potential benefits of aligning e-Portfolio concepts with career management and development outlined in the literature, both universities prioritised Career Development Learning as an augmentative component of their e-Portfolio implementations. This is a priority area due to the projected global reach of e-Portfolios, the expansion in online commercial career services, and the physical limitations in linking student career counsellors to the increasing number of University students. The RMIT interactive website, Career Track, has been designed as a career development guide that supports student career progression through online guides and reflection activities. Rather than duplicating this resource, UniSA Career Services staff efforts focused initially on collaborating with RMIT to tailor resources for specific discipline areas.

Portfolios are perceived as an aid to developing reflective skills, with value as a means of developing transferable skills (Roberts et al., 2005). Many institutions list a set of common graduate attributes that are attained across all programs. The value and transferability of graduate attributes has been questioned. It is seen as problematic unless
viewed with a holistic perspective, acquired via a process associated within different social
groups and contexts, that can include settings outside of university (Hager, 2006).

Improving employability of graduates is one of the reasons why institutions are
interested in implementing e-Portfolios across all disciplines. Professional competencies can
provide a useful framework for forming professional identities and evidencing requirements
to enter a profession. Nursing, medicine and education disciplines have a history of using
portfolios for learning and employment, whereas disciplines, such as engineering and science,
have more recently begun to introduce learners to the benefits of e-Portfolio use (McAllister
et al., 2008, Butler, 2006).

A focus on professional identity over a more integrated view of an individual is also
cautioned by Cambridge 2008, page 248:

Such conflation of organizational and individual interests threatens to extend the
power of organizations beyond work into the whole of human personality, leaving
little space for anything else

This echoes concerns raised in the literature regarding adopting an institutional
perspective of e-Portfolio requirements (Barrett and Wilkerson, 2004), as this fosters
extrinsic based motivation for their use. As intrinsic motivators are preferred in order to form
a lifelong learning culture based on student needs, the inclusion of e-Portfolios in assessment
provides an opportunity to change ‘from assessment of learning to assessment for learning’
(AeP, 2008). The development of resources to fit the various needs of learners, professions,
and institutions takes time and will continue to be an opportunity for CoPs to collaborate for
many years.

Connect Across Boundaries

Whilst student surveys confirm the value of e-Portfolios for job seeking purposes,
employers are not yet using e-Portfolios pre-interview stage (Wilhelm et al., 2006). Research
with teaching administrators suggest that increasing awareness of e-Portfolios is required to
gain employer acceptance and use (Strawhecker et al., 2007).

It has become evident through our case study that early involvement of stakeholders
beyond our CoP is required. The accreditation process for Engineers Australia requires
students to undertake vacation reporting, and evidence capability development as part of
graduating as an Engineer. In 2009, the collaborating universities commenced translating the
evidence basis for Engineering accreditation into e-Portfolio form, using a combination of the
Profiler, Proforma and Webfolio functions within PebblePad. The outcome from this approach is the institution-wide availability of a Web-template that features standard fields aligned to Engineering Australia’s objectives, and readily populated with the requisite student output.

From the students' perspective, their accreditation expectations and outputs are directly embedded in their e-Portfolio and therefore accessible at times and locations that are convenient to them. By deploying a singular but well developed process, both institutions are able to commence the translation of accreditation work process into a flexible digital format readily shared with employers and other career-relevant parties external to the University.

Collaboration will continue on this initiative with the view that it will increase student international mobility, and provide a useful model for other discipline areas.

**Foster Collegiality**

The collegiality between institutions includes a shared research agenda to evaluate the implementation of an e-Portfolio approach on teaching and learning outcomes. Secondary research questions explore usability and uptake of the technology, student self-awareness of learning, evidence of taking responsibility for learning, academic integrity, and development of graduate qualities/attributes.

To enable benchmarking, a common evaluative survey instrument was developed between RMIT and the University of South Australia. The student survey component consisted of sixteen questions with a Likert scale response and the provision for an additional two questions designed by the individual teaching staff. An open-ended question concluded the survey. The student survey questions were designed to assess the student learning experience using e-Portfolios. The questions encompass the student’s perception of the role of e-Portfolios in their course and the potential for e-Portfolio use in their future professional careers.

Questions addressing skills development, the usefulness of the support materials provided to the students, and the use of e-Portfolios for self evaluation and personal reflection were also included. The final open-ended question provides students with the opportunity to present their personal views on the use of e-portfolios within their course. A modified version of this survey for staff use will obtain feedback from teaching staff participating in e-Portfolio projects.
Administration of the student surveys was agreed to take place on the final day of teaching and assessment activities for a subject. Both institutions acknowledge improvements to the process of developing the survey instruments and applying for ethics approval that came from collaboration in this area.

Without this level of collaboration the comparison of survey results would not be possible. The survey has since been shared with other institutions through the Australian e-Portfolio Symposium and have been placed on the RMIT website (Chiswell and Faulkner, 2009). Discussions have also taken place on the sharing of data collected, and planning a longitudinal approach to evaluating the impact in supporting teaching and learning outcomes.

Integrate With Other Work Practices

The movement towards using a fully digital environment to produce student assessable work, such as an e-Portfolio, introduces a greater potential for compromising university values of academic integrity (Allan, 2009). Both institutions have placed emphasis on the importance of a whole-of-university approach to the promotion of academic integrity (Allan, 2009, Bretag, 2008), and are commencing a parallel investigation into the use of plagiarism detection technology within the student e-Portfolio system. A study of this type addresses the tension between the provision of an e-Portfolio as a truly student-owned personal learning environment and the institutional expectations of Universities. The e-Portfolio trials will inform the respective institutions as to the student value of institutional e-Portfolios offered within a burgeoning world of no-cost Web 2.0 services.

One outcome of the CoP focus on this area was submission of an application for national funding to expand our work in this area. Unfortunately, this was not successful but did consolidate thinking on the integration of e-Portfolios with concepts, such as academic integrity.

Members of the CoP may expand their interest in e-Portfolios with other work activities or areas of research interest. Evidence indicates that e-Portfolios increase both student engagement and retention when portfolios are designed by the learner as much as the institution (Yancey, 2009). Engagement was also reported to increase when moving from paper based to electronic portfolios (Piper et al., 1999) cited in (Stansberry and Kymes, 2007). Further research into why e-Portfolios provide such benefits will intersect with literature in other key areas, offering the opportunity for broader collaboration.
Collect Stories of Experiences for Action-Learning

The establishment of a bi-annual forum between the two institutions provides a mechanism to share knowledge and experiences on the use of e-Portfolios. The forums have combined a narrative showcase from pilot areas with discussion on emerging themes or common areas of interest. In 2009, both institutions have invited staff from other institutions to the events where they have become Australian PebblePad User Group meetings. This is an example of how a CoP can be members of a larger CoP to aid collaboration in this dimension of CoPs. The commitment of UniSA and RMIT to connect with staff involved in e-Portfolio development has aided formation of an Australian User Group for use of PebblePad, creating additional networks.

Technology has been used to compliment face-to-face meetings adding new challenges. For example, an inability for some groups to connect via video conference were overcome when five Access Grid Rooms were connected in September 2009. This technology requires advance planning to coordinate the availability of rooms used for teaching and support of skilled technicians. A limitation is that it does not record the broadcast. Additional recording equipment is required to collect stories for reflection and research purposes. Despite this, it offers sufficient benefits of fostering collegiality in CoPs separated geographically for future use.

Evaluation of 2009 pilot projects is ongoing to inform plans for e-Portfolios in 2010. Initial reflection on the common themes in feedback and data collected to date suggest areas for improvement.

The involvement of students in showcase events and participation via in-depth interviews has provided valuable perspectives that supplement the information provided by staff. The response to the implementation of e-Portfolios from students and staff has been mixed with quite polarised views from students. A number of technical problems negatively affected the learning environment and their impact depending on the technology skills, curriculum task design and time and place of system access.

The need for a learner to have already acquired knowledge and skills and to have developed a critical and analytical disposition required for transformation was highlighted as an inherent problem in how learning is sometimes conceptualised (McMahon 1999).

For e-Portfolios to support transformative learning (Mezirow 1991), learners require the ability to navigate the technology, skills for reflection and information management and
self-directed learning to include learning outside of the curriculum. Our experiences suggest there is a benefit of staff engagement with e-Portfolio concepts prior to their use by students.

The personal use of e-Portfolios by staff provide interactions that increase knowledge and transformed their identity to a level required to trial e-Portfolios for use in teaching practice (JISC 2009). This suggests an area where academic development can support e-Portfolio implementation.

This paper has focused on the benefits of incorporating CoPs, but there are other relevant concepts that may be useful for supporting e-Portfolio implementation. Knowledge Communities (Craig, 1995, Craig, 1992) are an example, distinguished from COP as follows (Seaman 2008):

- CoPs focus on the community, promoting active and conceptual thought relating to practice, generating both qualitative and quantitative data, learning is a social process with a defined lifecycle.
- Knowledge Communities focus on the individual, promoting reflective and contextual thought expressed through narrative, generating purely qualitative data, with individual improvement shared with others as learning is both social and a personal process.

Both have face validity in the implementation of e-Portfolios by institutions and provide different aspects of the interaction between community and individual development via e-Portfolios.

**Synthesis**

This paper is informed by the guidance provided as a ‘key to knowledge strategy’ (Wenger 2000) and presents experiences against the initial intentions and expectations informed from CoP and e-Portfolio literature. It has provided a case study of how knowledge relevant to e-Portfolio implementation can be provided by CoPs formed across institutions. The key steps include:

1. Map key knowledge needs: Identify potential collaboration partners, collaboration areas and goals
2. Develop and connect communities: Establish mechanisms to support and grow opportunities for interaction
3. Create resources to aid e-Portfolio implementation: Develop and evaluate resources for their support of individual, profession/discipline level, and university-wide implementation of e-Portfolios.

4. Connect across boundaries: Invest in building ‘bridges’ to remain aware of the dynamic environment surrounding e-Portfolios and to invite peer review to the CoP processes and outcomes

5. Foster collegiality: Support professional development in development of identity and knowledge resources and sharing with colleagues

6. Integrate with other work practices: Provide legitimacy of the CoP within the institution

7. Collect stories of experiences for action-learning: View ePortfolio implementation as a learning process

**Summary, Conclusions and Implications**

The potential value of CoPs to support e-Portfolio implementation has been summarised with emerging evidence provided from a case study of two Australian institutions. A wide variety of factors were identified and supported from our case study experience to points made by practitioners at the Australian e-Portfolio Symposium in 2009 (AeP2).

The main conclusion from our endeavours is that collaboration with aligned institutions and staff is beneficial. Table 1 offers a broad and varied range of areas to consider when implementing e-Portfolios. When forming CoPs these may aid discussion of priority areas for collaboration and confirm alignment of perspectives and the level of support available. The level of support available to informal groups like CoPs may fluctuate with the transition of members and competing priorities from other areas of their lives. It is prudent to start implementation on a small scale initially, allowing time necessary for staff and students to learn new concepts and technology whilst securing the support required from formal structures that provide funding and other resources vital to wide-scale e-Portfolio use.

This paper provides one perspective on CoPs for e-Portfolio implementation; no doubt there are many other ideas. Participants in our AeP2 presentation activity listed their ideas for effective and sustainable collaborative efforts of CoPs. These are similar to the approach used in this case study.
• student consultation
• map potential areas and agree priorities for collaboration
• ensure value is added from the collaboration for both partners
• select areas with similar contexts, but not necessarily the same goals
• provide a mechanism for collaboration with facilitators and opportunities to share ideas

Areas suggested for further research include:

• Further case studies that examine the benefits and challenges of e-Portfolio CoPs
• Longitudinal evaluation of benefits offered to learners, professions and institutions of e-Portfolios and community interactions
• Understanding how and why e-Portfolios do (or do not) support learning and identity formation.

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Transitioning From Print-Based To Digital Teaching Portfolio Assessment in a Foundations of University Learning and Teaching Subject

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Abstract

The concept of a teaching portfolio in higher education is not new. However, for many teaching staff the concept of a digital or electronic teaching portfolio is very new - a perspective that cannot be ignored. Academic developers have a role to play in their institutions in making the concept of a digital portfolio understood by staff, and making transparent the many and varied options available to them to develop their own electronic portfolio. At one Australian university the elaboration and application of a teaching portfolio as a capstone assessment task has been embedded in a stand-alone Foundations of University Learning and Teaching subject as a way of documenting staff learning about their teaching as they progress through the semester-long subject. This paper focuses on the processes and application of guiding staff to make the
transition from a print-based to a digital teaching portfolio, and makes recommendations for introducing a digital teaching portfolio into a Foundations subject for academic staff new to teaching and learning in higher education.

Keywords:

**Introduction**

In this paper we use the terms digital portfolio and e-portfolio synonymously to mean “a collection of work, objects or items selected by the portfolio author that provides evidence of a particular nature for a particular purpose” (Hallam, Harper, McCowan, Hauville, McAllister & Creagh, 2008, p. 3) which is presented in a digitised format – in our context in this paper stored on portable media such as CD, DVD and thumb drives or memory sticks. It is well documented (Stefani, Mason, & Pegler, 2007) that university staff may benefit from the use of digital portfolios, given their many and varied uses and that this in turn may help students develop digital portfolios as well. At our university we have designed a Foundations of University Learning and Teaching subject that has within a capstone assessment task featuring a print-based teaching portfolio. Late in 2008 we had decided to offer staff the opportunity to present their teaching portfolio in a digital format. The question as to how to best provide academic staff with the skills to develop a digital teaching portfolio was the basis for many discussions amongst our teaching team. Suggestions such as a single, one-off workshop were dismissed in favour of a meaningful and developmental approach throughout the duration of the subject that helped staff to acquire the skills to present their portfolios in an electronic format. This paper provides details about the Foundations subject, why and how we have used PowerPoint™ to help staff make the transition from a more traditional print-based assessment task to a digital format within the subject, and makes recommendations relevant to the introduction of a digital portfolio as an assessment task in a learning and teaching development subject.

**Background**

The Foundations of University Learning and Teaching subject is designed as a stand-alone subject for academic staff new to university teaching. Spanning 14 weeks, the subject has
been planned as the first in a sequence of four subjects which could form a Graduate Certificate in Higher Education in the future. The primary focus of the Foundations subject is to introduce participants to the theory and practice of teaching and learning in higher education, and to enhance the individual academic’s teaching effectiveness. Several theoretical frameworks underpin this subject – the concept of reflective practice, critical reflection, and peer review and feedback (Bell, 2005). The requirement for teaching staff to attend this subject is embedded in a clause in the university’s Recruitment and Selection policy which requires all fulltime continuing staff to complete the subject unless they hold a Graduate Certificate in Higher Education or has less than five years experience in teaching in higher education. In reality, staff enrolments in this subject include staff on both short-term and fulltime continuing contracts with a range of teaching experiences.

The subject design is based on a two-module structure. The first module provides immediate and practical assistance to enable teachers to begin their exploration of teaching and learning in higher education. The core workshop which opens this module is a whole-day event. Subsequent sessions in the form of workshops are run in the evenings from weeks one through to week six. The second module is an independent study module comprising peer observations using peer support colleagues (Bell, 2005) who provide constructive feedback on observed teaching sessions, and a series of short assessment tasks which focus on the development of critical reflection processes amongst participants. Staff are also asked to develop a beginning philosophy of teaching statement which draws on their learning in the subject and their reflections on their teaching during the semester. A small teaching portfolio is used for the presentation of individual teachers’ learning at the end of the subject. With the first cohort this portfolio was presented as a print-based document using a prepared template.

Concerned about issues of portability and wanting to make use of digital technologies currently available to staff, we decided to make the transition in 2009 from a print-based to a digital portfolio format using PowerPoint™. Our rationale for using this software was based on the fact that it is widely available to staff and commonly in use across universities. Presentations can be saved to USB sticks, CD, DVD and/or placed on faculty or university servers. Going digital with a teaching portfolio is also a way to enhance a less explicit outcome for teaching staff – the development of “21st century literacies, or multi-literacies” – the ability to combine text, graphics, sound and video and to understand the processes involved in combining some or
all of these media for presentation and communication purposes (Hartnell-Young & Morris, 2007, p. 14).

In Week 12 of the semester, participants and their peer colleagues are invited to a recall session to provide feedback to subject facilitators and share their experiences of the subject. This feedback together with a written survey completed by subject participants is used for subject improvement. Staff who have successfully completed the subject are recognised at a special Rewards and Recognition event held annually at the university with the expectation that they will create conversations about their learning in this subject with others and encourage their peers to enroll.

The subject is also blended in several ways. The use of a subject website on a BlackBoard™ platform acts as an overall support for the face-to-face mode of delivery used in the first module. Additionally, different technologies are blended. These include the USB stick that contains all of the resources for the subject, as well as the tools that are part of the website that participants are expected to use – the digital drop box for posting of assessment tasks, the discussion forum for sharing of reflections about teaching by participants and their facilitators, and individual blog spaces where participants can choose to use to record their thoughts, ideas and reflections on the subject and their teaching. The authors encourage participants to draw on their blog postings to develop their portfolios but only a few of the subject participants have made use of the software for this purpose.

**Literature Review**

E-portfolios serve numerous purposes. Although our purpose in using an e-portfolio in this Foundations subject is for assessment, its long term goal is far more reaching. Hallam et al. (2009, p. 56) make the claim that:

…the implementation of e-Portfolios in the curriculum will only be effective if they are integral to the learning activities or the assessment and if they have a specific and integrated purpose. The introduction of e-Portfolios as a learning or assessment activity therefore requires academic staff to consider the learning goals for the subject and to subsequently evaluate the extent to which there is congruence between learning activities, assessment and learning outcomes.
The scaffolding of tasks that required deep reflection and which culminated in such outcomes as the development of a philosophy of teaching, as in our learning design of the subject demonstrated congruence. Several types of portfolios have been identified: “learning” and “personal development” (Hallam et al., p. 4); “activity-reflection” (Richards, 2005); and “emergent, virtual and practitioner” (Leggett & Bunker, 2006). It seems that the latter type of portfolio applies to the Foundations subject. While not the intent of this paper, it raises questions as to how graduates of the Foundations subject will use this initial knowledge of digital portfolios in the future.

Several frameworks have been proposed that guide the development of portfolios and implicitly the teaching of such. One such framework focused entirely on the introduction of student portfolios across an institution is proposed by Love, McKean and Gathercoal (2004) who suggest five “levels of maturation” or a pathway towards full implementation of student e-portfolios within an institution:

- Level 1 – scrapbook or collections of assignments, awards, etc. received by students over a period of time;
- Level 2 - curriculum vitae which provides a template to guide students as to content used for employment purposes or as evidence of completion of a program of studies;
- Level 3 - curriculum collaboration between student and faculty which provides a template and which provides opportunities for students to choose which content to put into the portfolio. The shift between Level 2 to Level 3 is marked by the use of formative and summative feedback on content, and access is enabled to both employers, teachers and others nominated by the student;
- Level 4 – mentoring leading to mastery which build on Level 3 portfolios but also enable multiple opportunities for students to receive feedback and adjust the content of the portfolio based on feedback from mentor/s;
- Level 5 – authentic evidence as the authoritative evidence for assessment, evaluation and reporting, building on previous levels of maturation, where the e-portfolio is the single mechanism by which mastery over content, standards of achievement, etc. over a period of time is on display and accessible by students, teachers and employers.

These authors emphasise that from Level 3 onwards the functionality of the e-portfolio changes and the organising schema for the portfolio is either a set of curriculum requirements or
educational standards or both (pp. 28-29). The print-based portfolio in our instantiation of portfolios is reflected in Level 2, where a template assists participants to organise and construct their portfolios. In our transition to a digital portfolio there are aspects of Level 3 maturation in evidence, in the enabling of some choice for participants in the organisation and selection of artefacts facilitated by the capabilities of Powerpoint™.

Further, Avraamidou and Zeembal-Saul (2002) report on several studies which list outcomes arising from the use of digital portfolios – they encourage improvement, motivate involvement in learning and self-evaluation, and promote higher level thinking. Documentation using the concept of hypermedia also offers better management, storage, and distribution. Pelliccione and Dixon (2008) affirm that the process associated with the production of a digital portfolio enables students to become stakeholders in their own progress and, in the longer term use of e-portfolios, drivers of their own development.

Building the capacity of reflection to enhance teaching and student learning (Bell, 2005) was another significant framework. Groom and Maunonen-Eskelinen (2006) note the unifying theme in the emerging corpus of international literature on the use of portfolios was reflective practice. We concur with Avraamidou and Zeembal-Saul (2002) who, in defining the meaning of reflection, cite the words of Dewey (1933, p. 6): “Reflection is an active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds supporting it and future conclusions to which it tends”. These authors further review the literature to confirm that many new teachers hold well-established practices about teaching and that through the process of reflection these views could be challenged and made explicit, while at the same time considered alongside contemporary approaches to teaching. This indeed was our challenge as academic developers - how to best use reflection to promote growth. It was assumed that the academics enrolled in the Foundations subject could benefit from a challenge to entrenched views or processes – if not to change their practice at least to confirm all or aspects of their practice.

Reflection became the cornerstone of the learning design in the Foundations subject. Groom and Maunonen-Eskelinen (2006, p. 293) note that the ‘impact of continuous change processes in education requires teachers to continually refresh and develop their skills’. However, although we have provided a process and a way of documenting their ability to adapt to change, Leggett and Bunker (2006) caution us in the expectation that the stresses of teaching
in a modern university may militate against this occurring. The depth of reflection in the tasks in the Foundations subject increased from the first task to the final task, but it was from a synthesis of these reflections that we expected the beginnings of a philosophy of teaching would emerge together with a strong articulation of this philosophy into individual’s teaching practice.

Designing a learning environment in which assessment, curriculum and active learning strategies align and promote motivation and reflection seemed imperative if academic staff, the learners in the Foundation subject, were to be themselves engaged in learning. In contrast to the key learning outcomes of the subject, which were to be achieved through reflective practice and later assessed, knowledge of, and the process of building a digital portfolio was a non-assessed outcome. Building a portfolio was essentially about collecting evidence of the achievement of the learning outcomes, and presenting these through a dynamic medium. The intellectual content of the portfolios whether print-based or digital and the related issues of identifying quality, selecting appropriate evidence, and developing standards were associated with the outcomes and assessment of portfolios.

It was expected that participants would want to learn how to ‘build’ a digital portfolio in order to show that outcomes had been achieved in an individual and unique way. The cultural theorist Henry Jenkins (cited in Reese and Levy, 2009, p. 3) uses the term ‘convergence culture’ to explain a view of motivation and one we support:

Convergence culture represents a paradigm shift – a move from medium-specific content toward content that flows across multiple media channels toward the increased interdependence of communication styles, toward multiple ways of accessing media content, and toward ever more complex relations between top-down corporate media and bottom-up participatory culture

Various studies of teachers endorse the motivational power of digital portfolios (Kankaanranta, 2001; Pelliccione & Dixon, 2008). Linking the outcomes of the subject with the vehicle and mode of presentation – a portfolio - laid the impetus to learn about portfolios. Such a view was not without consideration of the resistance alongside the ‘unmitigated optimism’ (Tisani, 2008). Motivation to build a successful portfolio would be implemented and maintained through three strategies: all the assessment tasks would be meaningful; a developmental
approach to teacher learning would be adopted; and technology would be the affordance to facilitate meaningful learning.

Meaningful learning although developed by Ausubel (cited in Lefrancois, 1997) in relation to expository style teaching and therefore verbal learning, is used here to refer to the association that the learned knowledge of what constitutes a digital portfolio would be better understood by staff because of its association with their personal experience of collecting and categorising data (evidence) and how this could best be shown. The new knowledge (digital portfolios) is then stored in the brain with associations and relationships obtained through the analysis and critical reflections of the teaching practice experiences. Participants may be inserting pictures, creating animations and linking files to demonstrate the growth and changes made to their own personal teaching and learning practices. Meaningful learning is created when associations are personalised. Our expectation as academic developers was that new knowledge acquired by staff studying this subject would take the form of changes made to their teaching practice. Further, these changes would be presented through reflection and documented through the portfolio. And, as meaningful learning is also a constructivist approach (Lefrancois, 1997; Stefani et al., 2007), it is the learners themselves who make the associations and build others in authentic ways and make decisions about their own philosophy of teaching and their teaching practices over time. A constructivist approach may, but not necessarily, imply a developmental approach to the construction and continual building of knowledge.

A developmental approach framed the assessment strategy and therefore each assessment task in this subject, as well as the learning about digital portfolios necessary for the final assessment task. We wanted staff to begin with a simple concept of portfolios and through experience extend and build on this concept, eventually understanding its complexity. It is easy for any portfolio to grow like topsy when there is no sound structure and purpose resulting in the application and potential to which it may be suited overlooked. It has previously been noted (Stefani et al., 2007, p. 58) that if e-portfolios “become a jumbled collection of photos, artefacts, unconnected ramblings and other media-rich items, they may have been ‘fun’ to assemble but they have lost their educational value”. To prevent such possible chaos we provided a deliberate and planned structure so staff could layer their own and new understanding of a teaching portfolio and the more familiar functionality of PowerPoint™. Each assessment task was not an end in itself. Rather, the tasks were scaffolded so that the skills, knowledge and values acquired
in the first task formed the basis for the subsequent tasks. Concurrently, academic staff were also learning about the functionality of PowerPoint™ to create digital portfolios. What was less explicit was the forging of associations between the two. In short, this meant that a developmental approach to learning about digital portfolios and their own teaching practices was essential in our learning design.

Integral to the developmental nature of learning about teaching and the learning about digital portfolios was our understanding of the interaction of time and the process of reflection. Time is rarely mentioned in the literature beyond reference to monochromic time. There seemed the need for us as academic developers to acknowledge an internal personal growth time needed to process ideas and concepts, and an external formalised assessment time in which staff presented their accomplishments up to a particular date and time. The physical time demanded by each of the assessment tasks in this subject required considerable “real time” to complete, but the actual time required to synthesise the meaning and outcome from reflections required a time that lay outside a formalised timetabled subject schedule. When learners engage in reflection they enlist thinking processes which enable them to link different pieces of information, contrast different pieces of information and combine different pieces of information.

Groom and Maunonen-Eskelinen (2006, p. 292) remind us that the classroom is a “complex and multifaceted context that requires the teacher to continually review and reflect on their work” in order to make conscious their knowledge. These linking, contrasting and hypothesing processes continue in the background while each new assessment task is physically completed. Denying learners need for both these internal and external times may limit their learning. Time was central to the scaffolded nature of the three main reflections in our learning design. This meant the learning inherent in each task, an outcome from reflection, was the basis for the following task. The holistic developmental approach was in congruence with the internal personal growth time needed for learning.

One means of providing support for the management of time in the reflective process was found in technology. Utilising the affordances of technology—in this case the blog tool—staff in this subject could record the many “moments’ thoughts”. These thoughts became the data for further reflection and synthesis of ideas about themselves as teachers. Staff could draw on these to develop a teaching philosophy and as evidence for claims made in their digital portfolio.
Adopting technology appropriate to digital portfolios was intended to be one aspect to motivation as already noted. We concur with Stefani et al. (2007, p. 58) that if learners “are given the tools to control the look and feel of their portfolios, to create dynamic, innovative presentation of their work and [reflections], they are more likely to engage with the process beyond the formal [subject] requirements”. Also important is consideration of the growth trajectory of staff to use and competently employ features of PowerPoint™. We acknowledge that developmentally each teacher may be at a different point in their understanding and use of this software or other digital tools. Transitioning from print-based to digital portfolios enables teachers to better demonstrate the links associated with their learning, as learning cannot always be presented linearly.

The Transitioning Process

Table 1 articulates the transitioning process from print-based to digital portfolios that occurred within the Foundations subject. The first column of the table indicates the process of introducing the concept of the portfolio and the elements of the portfolio, which remained unchanged from the print-based format - we still required a teaching philosophy, description of their discipline, etc. The second column shows the resources we provided for staff to develop their portfolio for each of the elements. The third and fourth columns explain the requirements for each of the elements in the print and the digital format, showing in the fourth column the changes that were made to the digital format. The fifth or final column of the table provides additional comments and articulates changes to the whole transitioning process.
<table>
<thead>
<tr>
<th>Process and elements</th>
<th>Resources</th>
<th>Print-based portfolio</th>
<th>Digital-based portfolio</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Process</strong></td>
<td>Initially, one hour session within the core workshop for the subject, demonstrating the concept of a portfolio as a “box under the bed” from which artefacts are taken and used as evidence of accomplishment or achievement. A print template was introduced briefly.</td>
<td>Further exploration in week four of the semester was made whereby a print template was provided to staff which tightly structured the portfolio and encouraged a “dumping” of evidence. This encouraged little reflection and a repeating of evidence and information.</td>
<td>Introduction to portfolios was made in week one of a 14 week semester. The concept of a portfolio and the final assessment task in which the portfolio was the vehicle, was made more explicit. The same hands-on session delivered for print-based portfolio remained.</td>
<td>We emphasised the link between assessment and how doing it through a digital portfolio would provide more scope to show evidence of learning. We consciously began building the conceptual side of a digital portfolio by relating this to <em>all</em> assessment tasks in the subject, and not just the final task.</td>
</tr>
<tr>
<td><strong>Element 1</strong></td>
<td>All elements of the portfolio were listed in the Foundations subject guide and final assessment task.</td>
<td>We provided a sample of a print portfolio in the scheduled session in week four.</td>
<td>The sample was a quality product, used again and maintained, as was its sequence within the subject.</td>
<td>A demonstration was made on how to create hyperlinks to a well-constructed table of contents.</td>
</tr>
</tbody>
</table>
| **Element 2**  
Teaching demographics | An example of a table was provided which showed subject, student numbers, semester taught. | Participants completed a table using guidelines provided | No changes were made. | Multi-media suggestions were made and demonstrated as evidence to the claims and summaries of an individual’s teaching. |
|---|---|---|---|---|
| **Element 3**  
Teaching philosophy | Readings, websites, examples of other philosophy of teaching statements | Teachers invited to attend a Philosophy of Teaching workshop scheduled as campus-wide workshop. No time allocated in other sessions to incorporate this significant element. | Specific three hour session allocated to developing a philosophy of teaching statement, using a workshop-based approach. Workshop feedback indicated enhanced understanding about philosophy of teaching statement structure and content. | It was necessary to dedicate a session to developing a teaching philosophy and further to explain how this could be used in a digital portfolio to link to other elements of the portfolio. |
| **Element 4**  
Reflection on teaching with subject facilitators (observers) | Observation schedules were provided. | Two observation schedules adapted from the skills approach to teaching used. All were to be scanned and submitted in the assessment task. | Two observation schedules were modified to better reflect a focus on how teachers addressed student engagement. | Participants were now open to presenting documents in ways other than using a regular scan to provide evidence of teaching, planning and feedback. The newer schedules provided a stronger focus on activity and engagement. |
<table>
<thead>
<tr>
<th><strong>Element 5</strong></th>
<th>Reflections on teaching with support colleagues</th>
<th>Support colleagues were specifically selected and matched with participants across disciplines.</th>
<th>Participants were responsible for making contact and negotiating times for observations.</th>
<th>No changes were made</th>
<th>Participants were now open to the incorporation of other media such as photos as evidence of the changes to their practice.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element 6</strong></td>
<td>Reflections on observations of support colleague’s teaching</td>
<td>No additional resources required</td>
<td>Participants listed attributes from support colleague’s practice they would like to use.</td>
<td>No changes were made. However we encouraged deeper reflection to be evident through the functions of PowerPoint.</td>
<td>Participants could now be creative in how they might present their observations of their colleague’s teaching.</td>
</tr>
<tr>
<td><strong>Element 7</strong></td>
<td>Critical reflections and overview from all feedback</td>
<td>No additional resources required</td>
<td>Participants were inclined to present this as list of positive observations.</td>
<td>Tables, clips and photos appeared in the portfolios.</td>
<td>Where once the critical review was text, the opportunity to create web links to resources and theory and present summaries in different ways is possible.</td>
</tr>
<tr>
<td><strong>Element 8</strong></td>
<td>New learning and understanding about teaching</td>
<td>No additional resources required</td>
<td>Statements were made with some evidence of new learning and its relationship to theory</td>
<td>Greater opportunity to present evidence of new learning and its relationship to theory differently.</td>
<td>Participants can be creative and dynamic in the presentation of their own new learning about teaching and how this marries with, concurs or is an application of theory.</td>
</tr>
</tbody>
</table>
| **Element 9**  
A personal evaluation of teaching competence | No additional resources required | Participants identified strengths and weaknesses and how to address the latter through text. | Participants identified strengths and weaknesses and how to address the latter through links and text. | Participants have an opportunity to present the past and the present in response to showing evidence of their teaching competence in other formats than text. |

**Table 1: The Transitioning Process from Print-Based to Digital Portfolios**
The two centre columns in the table summarise our expectations in the print-based and digital-based iterations, and the last column is a comment on the all-too-important process to enable the transitioning to occur. As noted earlier in this paper, attending to “real time” was significant in developing the processes to support the transition. In the initial offering of the subject we designed the portfolio assessment task to include elements of a traditional teaching portfolio, among them a table of contents page and information about the classes taught by staff. This print-based view provided its own limitations, particularly the linearity of the text format. Despite this limitation we believed it was a suitable structure for staff with limited or no knowledge of teaching portfolios. The feedback from staff at the end of the subject confirmed the initial lack of understanding of the nature of a teaching portfolio. One participant commented she had no idea what an e-portfolio or portfolio was beyond the concept of an artist’s collection of his best work and perhaps that it would be done on a computer. Another teacher indicated some prior knowledge about portfolios believing them to be a sort of digital diary where evidence for promotion or teaching feedback would be kept.

PowerPoint™ has the potential for embedded and richer additions to a portfolio all of which can be used when academics are developmentally ready to engage with these functions. One teacher commented that she thought a digital portfolio using this software might be too dependent on series of bullet points and was worried about it appearing “gimmicky”. After an additional session on using PowerPoint™ to build a portfolio, she realised its potential to add more through hyper linking to validate claims and to present a more visually stimulating document.

When we first offered this subject, teaching portfolios were introduced very briefly in the whole-day workshop, and discussed later with staff on different occasions throughout the semester. Although participants submitted a portfolio 14 weeks after its introduction as required, we felt that had the concept been introduced differently and staff had been given more planned opportunities earlier in the subject to think in what way the capabilities of PowerPoint™ might assist them present particular information and reflections. By introducing the digital portfolio concept at the very beginning of the subject more time would become available to consider the constraints and develop responses on how best to overcome these. In the print-based version staff
complied with the table of contents, but did not fully embrace the concept of a portfolio. When we made the shift to digital portfolios we did so earlier in the subject schedule and created a stronger link to assessment. Issues of ownership, multimedia components, reflection, evidence, and multiple presentations are likely to become more significant in the digitised format (Stephanie et al., 2007) as they did for our staff. An additional benefit to staff is the preparation process it offers those who may apply for promotion — it becomes the enabler for clear categorical thought to write to specific criteria. Staff thinking and learning related to the selection of evidence for inclusion in a portfolio to demonstrate their learning and their teaching acts as a simulation in preparation for such events as promotion or teaching awards.

**Conclusion and Recommendations**

The interaction of the functionality of PowerPoint™ and teachers’ technical competence to produce creative and dynamic digital portfolio with reference to evidence is about to be assessed and evaluated for the second time in this capstone subject. In the future the university will be examining e-portfolio systems for students and staff and we may be in a position to make the transition from this presentation software to a broader electronic portfolio system. As academic developers we set out asking how competence in the development of e-portfolios that demonstrated their learning can best be achieved by academic staff. Embedding the learning in a cumulative assessment approach throughout the subject along with a model of digital portfolios was essential. Planning a number of processes, some of which were to work concurrently, was essential to achieving this ‘how’ question. Some staff queried what should be included and excluded from a portfolio but with discussion and focussed questioning related to the purpose of the portfolio, the audience, and the table of contents we provided, this was resolved. The intention of this paper was to document and inform our readers how a team of academic developers at one Australian university enabled academic staff to become familiar with portfolios but more importantly with digital portfolios. The planned and structured processes described and analysed in this paper aligned with the assessment tasks in a Foundations of Learning and Teaching subject provided the means for the transitioning from print-based portfolios to digital portfolios.
In conclusion, we offer our readers a number of recommendations for introducing a digital portfolio into professional development courses for teachers:

1. Portfolios must be considered as integral to the course or subject of study and not positioned outside the subject. For example, providing a once-only workshop is insufficient for staff to begin their own portfolio development, given the complexity and different purposes of portfolios. Introduce the concept of a portfolio and its key components in the initial sessions of the subject. Progressively providing opportunities for staff to build skills in digital portfolio development has implications for the learning design of the subject and impacts on scheduling and timing of assessment tasks.

2. Design concurrent opportunities across the whole subject for staff to (a) build skills in reflection about their teaching which, in turn, builds their evidence of learning within the subject, and (b) skills in the use of the digital tool for portfolio development.

3. Consider the purpose of the portfolio. In this subject, the emphasis is on a learning, or developmental portfolio, to reflect its primary purpose of documenting growth and change in staff learning about their teaching practices. The purpose of the portfolio will impact the way it is structured, the evidence that is gathered and the skills that staff need to complete the portfolio. We focused initially on learning theory and reflection processes, and enabled participants to record their thoughts progressively and ideas about learning as they move through the subject.

4. Provide a workshop on the development of a Philosophy of Teaching statement by all participants. The Philosophy of Teaching statement is the cornerstone of the teaching portfolio task. These statements grow and develop over time. Having staff begin to develop a statement of teaching philosophy early in their teaching careers is a positive step towards their development of a sense of “self” as a teacher.

5. Offer specific skills sessions for staff not fully acquainted with the level of sophistication of the software being used as a medium for a digital portfolio. In our additional session described above, we focused on developing an outline or storyboard, adding graphics, sound, movies and internal and external hyperlinks. We have found the text by Montgomery and Wiley (2008) particularly useful as a guide in this area.
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Portfolios Have Long Been a Part of Learning, Teaching and Professional Practice: Why Use E-portfolios And What Do Web 2.0 Tools Have To Offer?

Hazel Owen
Unitec NZ

Abstract

This paper will showcase what was, at the time, effective practice, whereby Foundation students at Dubai Men's College (DMC) developed an e-Portfolio as part of an integrated Computer, Research Skills and Projects Course. Reflective practice was encouraged through discussion, peer and tutor feedback and the use of rubrics. However, the e-Portfolios were not interactive or easily portable, and the final artifact was produced for assessment.

Several benefits beyond the 'static' e-Portfolio utilised at DMC have been identified, in particular around those created with Web 2.0 social software. Key positive outcomes indicated in recent research studies include increased and improved reflective practice, enhancement in the quality of final artifact (partly facilitated by multimedia and mobility), a clear authentic purpose, and a greater sense of audience. The audience is often interactive thereby helping to shift the locus of power from the teacher as knower. Underpinning these initiatives are a range of issues around assessment practices, Web 2.0 tools, professional development, and cultural considerations.

This paper has three main aims, which include the initial definition of e-Portfolios as a concept and the grounding of the subject in current literature and associated shifting paradigms. I will also refer to a research study conducted at DMC, and some of the findings and associated
implications. Finally, I will draw the threads together to illustrate how research has influenced practice by discussing how the findings from the DMC study have informed pre-pilot ePortfolio initiatives at Unitec NZ.

Keyword:

**Introduction**

Previous use of portfolios has traditionally been in the creative social sciences, including art and design, and architecture. Increasingly, however, other disciplines (such as engineering, and more recently education, medicine, and nursing) have started to adopt portfolios as a way of supporting self-reflective learning, and the creation of a record of learning and achievements, as well as helping to guide career management planning and the design of an organic CV. Portfolios, thereby, have the potential to support lifelong learning through, for example, the encouragement of practices such as producing multiple drafts informed by ongoing feedback, as well as reflecting, collecting and selecting pieces of work that represent evidence of achievements. Portfolios can therefore take the form of a ‘working’ or a ‘presentation’ portfolio.

Until relatively recently, portfolios have been collated and presented in paper format. However, mobility, as in the freedom of movement through myriad contexts (physical and cerebral), cultures and ‘knowledge’, is an imperative underpinning the re-determination of education theory and practice, as well as career paths. Digital natives appear to embrace this mobility, interacting with each other, locally and globally (Kloos, 2006), and engaging with new literacies to communicate, access 'rich contexts', question and collaborate. Therefore, Information, Communication Technology Enhanced Learning and Teaching (ICTELT) could, in theory, provide a way of not only supporting the development of portfolios that would reflect the entire duration of a person’s career, but also encouraging global collaboration and sharing.

This paper has three main aims, which include the initial definition of ePortfolio as a concept and the grounding of the subject in current literature and associated shifting paradigms. I will also refer to a research study conducted at Dubai Men’s College (DMC), and some of the findings and associated implications. Finally, I will draw the threads together to illustrate the
shifting paradigms around the concept of e-Portfolios, as well as discussing how research has influenced practice by discussing how the findings from the DMC study have informed a pre-pilot e-Portfolio initiative at Unitec NZ that utilises Web 2.0 tools. No comparative research study has been conducted, but rather the findings of research have been applied to address some of the challenges for use in another organisation and wider community.

**Literature Review**

The literature review provided here refers to several relevant aspects concerning e-Portfolios and their use. Opening with an overview of what is understood to comprise e-Portfolios along with some of the benefits identified; this section explores findings from current literature, and concludes with a discussion of concepts, tools, challenges, problems and considerations around using e-Portfolios with students.

A wide range of interpretations around what comprises an e-Portfolio exists, partly around factors such as purpose and format, as well as around the tools utilised. As such, there is no uniform definition of e-Portfolios (Hallam et al., 2008), which, in turn, increases the risk of placing the focus on e-Portfolios as products as opposed to process (Barker, 2006; Smith & Tillema, 2003). Even in the use of the term e-Portfolio, there is little consistency. Richardson and Ward (2005) discovered that one view of an e-Portfolio involved the collection and storage of digital artifacts on a portable storage device that is not accessible from the Internet, such as a CD ROM. Alternatively, they also found that ‘web-folio’ is used to refer to digital artifacts hosted in a Web-based environment.

Most definitions and descriptions recognise e-Portfolios as “a collection of ‘works’...that represent physical evidence of achievements” (Mason, Cochrane, & Owen, 2008). For instance, in the UK, e-Portfolios tend to be informed by the notion of Personal Development Records (PDRs) (Dearing, 1997), and are considered to be evidence of accomplishments, as well as an archive of associated reflections, which can be used to package and present learning and achievements (Richardson & Ward, 2005). Other basic definitions of e-Portfolios include “a tightly integrated collection of Web-based multimedia documents that include curricular standards, course assignments, student artefacts [created] in response to assignments, and
reviewer feedback to the student’s work” (Gathercoal, Love, Bryde, & McKean, 2002, p. 29). The JISC (2008) definition adds that the digital artifacts are used to express students’ experiences, achievements and learning. In contrast, this paper, with reference to the potential of Web 2.0 principles and tools, considers e-Portfolios to have the scope to be “a multi-faceted forum, with areas for collaborative development, private reflection, and showcasing of achievements” (Owen, 2009).

Six key purposes have been identified for e-Portfolios (Abrami & Barrett, 2005; Hallam et al., 2008; Ward & Grant, 2007; Zeichner & Wray, 2001):
1. **Presentation** (showcase of ‘best’ work and accomplishments either during study or in the workplace);
2. **Learning / process** (includes guidance around reflection, analysing, thinking critically, making connections, identifying problems, and learning over time);
3. **Assessment** (evidence to demonstrate specific learning outcomes to an ‘authority’);
4. **Personal development** (used for registration, certification, professional development, and career progression. Usually involves a review process, action plan, and recognition of required professional criteria);
5. **Multiple-owner** (enables a group or organisation to represent research, projects and growth); and
6. **Working** (includes some or all of the characteristics identified in 1 to 5 above – hosted in a tool that facilitates flexible accessibility/privacy to discrete elements of the ePortfolio. Specific elements could, for instance, be selected from a working e-Portfolio to create a presentation e-Portfolio).

Each of these purposes inherently supports facets of reflective practice and cumulative, chronological development. The collection and selection of artifacts requires a process of active, engaged evaluation and reasoning as to why an artifact is suitable for inclusion in an e-Portfolio, especially the constituents of a learning journey, required criteria or set of skills, that the artifact demonstrates (Abrami & Barrett, 2005; Klenowski, Askew, & Carnell, 2006; Smith & Tillema, 2003; Wade, Abrami, & Sclater, 2005). Another factor that the six types of e-Portfolio listed
above emphasise the need to be aware of the audience. A ‘warts and all’ learning portfolio is unlikely to be acceptable as support for a job application, for example (Butler, 2006).

The contents of an e-Portfolio can be numerous and are dependent on the identified purpose and audience. However, one of the central issues an education institution faces is where manifold purposes for e-Portfolios have been identified, resulting in poorly defined or contradictory aims and outcomes. This situation can be exacerbated when overly prescriptive guidelines are mandated (Zeichner & Wray, 2001), or where unsuitable, inflexible tools are adopted (Hallam et al., 2008).

Benefits of e-Portfolios in tertiary education include helping students to become focussed critical thinkers who can apply theories and concepts to concrete, authentic situations (Hauge, 2006), as well as creating an archive of learning progression over time (Smith & Tillema, 2003). Further associated positive outcomes are an enhanced sense of empowerment and awareness of personal attributes (Darling, 2001; Young, 2002), plus improvements in creativity, design, planning, self-direction, communication, and organisation skills (Brown, 2002; Bull, Montgomery, Overton, & Kimball, 1999; Campbell, Cignetti, Melenyzer, Nettles, & Wyman, 2001). For academic faculty, the potential for fostering lifelong learning and Professional Development (PD) planning engendered by the use of e-Portfolios is considerable (Hallam et al., 2008). Furthermore, other stakeholders, including employers and professional organisations, are showing increased interested in future possibilities, in particular those who employ graduates (ibid, 2008).

In contrast to the positive aspects of using e-Portfolios in tertiary education, there are several issues and concerns that have been recognised in the literature around learning and teaching, academic policy, pedagogy, institutional culture, implementation, training and tools:

- Tension between opinions around ‘value’, often with learners seeing the greatest value in Web 2.0 tools, and institutions in a fully-integrated e-Portfolio system (Siemens, 2004);
- Unclear purpose, use and guidelines (Smith & Tillema, 2003);
- Over-prescriptive guidelines (Zeichner & Wray, 2001);
- Few existing examples of e-Portfolios (Darling, 2001);
- Increased levels of learner confusion and anxiety when there is uncertainty about expectations and value of e-Portfolios (Wade & Yarbrough, 1996);
- High levels of initial scaffolding required for learners and faculty (Smith & Tillema, 2003; Wade & Yarbrough, 1996);
- Approaches to feedback can sometimes be inappropriate (Smith & Tillema, 2003);
- Conflict of the goals of learners, the tutors, the institution, and the wider community (Butler, 2006; Zeichner & Wray, 2001);
- Disadvantages of interoperability standards and specifications of some e-Portfolio systems can reduce flexibility for users (Siemens, 2004);
- Potential costs to an institution (licensing, development, maintenance, support, adaptation, resources, longevity, and ICT up skilling) (Hallam et al., 2008);
- Mis-match between assessment criteria, learning outcomes, and potential student competencies (Smith & Tillema, 2003);
- An uneasy dichotomy between development and the measurement of competency (Smith & Tillema, 2003); and
- Concerns about objectivity of assessment (Darling, 2001).

Attributes of e-Portfolio Systems

A wide range of e-Portfolio platforms is available to tertiary institutions. Siemens (2004) highlights central desirable characteristics of e-Portfolio tools, highlighting flexibility of input, empowerment of learners (for example, in the organisation of artifacts), and a clear link between what is done and how it will assist learners. Also, any use of e-Portfolios should be fully integrated into curricula in a way that recognises the necessity for dialogue, nurturing feedback, debate, and time. Other factors that have been identified as important are:

- Privacy / share ability;
- Portability;
- Choice;
- Design; and
- Ownership.
As technology innovations come to the fore, tools available for e-Portfolios change rapidly, sometimes with associated support implications. The four main categories of tools available to institutions are commercial software (including Learning Management Systems - LMSs), proprietary systems (often developed in-house), Open Source software, and Web 2.0 solutions (Stefani, Mason, & Pegler, 2007). There are many papers and reviews that compare the various tools (for example, Barrett, 2007) and a full overview is outside of the remit of this paper.

All decisions made around the choice, implementation and pedagogy underpinning e-Portfolios and the choice of tools resonates in their future use by academic faculty and learners. For example, if an enterprise e-Portfolio system is chosen one concern is that a mandated system might foster conformity and raise questions of ownership. Such applications tend to limit peer access, and the implication is that the ownership of artifacts and interactions hosted within it belong to the institution. Learner control is often limited to basic layout and colour scheme. On the other hand, if e-Portfolios are to be used in a programme as a reflection and assessment tool, then some level of consistency is desirable.

Sociocultural theory indicates that the process of human development, cognition and context are not discrete factors. Learning occurs in social settings (Tharp & Gallimore, 1989) comprising communities, rules, tools, and activities, where there is potential for an individual’s higher mental functions such as logical memory, verbal and conceptual thought, and complex emotions to mature (Kublin, Wetherby, Crais, & Prizant, 1989). Importance is thereby placed on cultural and social aspects of learning experiences (Owen, 2006), in turn signifying Web 2.0 as potentially desirable for e-Portfolios as discussed below.

Improvements in technology and connectivity have progressed hand-in-hand with a change in ethos around the use of the Internet, which was dubbed Web 2.0 by Dale Dougherty in 2004 (O’Reilly, 2005). Creativity, collaboration and sharing became key underpinning foci. Companies, rather than supplying the content, started to supply the platform for users to publish their own content, which is often in rich, multimedia formats. In turn, people around the world have the ability to collaborate, comment and communicate with the original creator, sometimes
resulting in the formation of communities with a common interest. Copyright is shifting alongside these developments, with creative commons licenses giving a wide continuum of usage rights (Owen, 2009).

When used as a platform for e-Portfolios, Web 2.0 has the potential to engage learners in the creative production and publication of written, audio, and visual artifacts for an authentic audience. Furthermore, the empowering, collaborative nature of Web 2.0 can also lead to the cultivation of a community of learning, personalised learning networks, sharing and discussion of ideas, co-construction of knowledge, improvement of ICT and Web literacy skills, and a greater sense of freedom and independence as a learner (Hallam et al., 2008). Although not without issues, Web 2.0 e-Portfolios address many problems related to portability, ownership, longevity, relevance, authenticity, and motivation while also “widening contexts in which learning is taking place…[bringing] together personal learning gained in multiple contexts” (Attewell, 2007, p. 59). Contexts include (but are not limited to) capturing authentic practice and learning ‘on the job’ (Wenger, White, Smith, & Spa, 2005). In addition, there is likely to be a shift in power whereby the teacher takes on a role of facilitator and guide (Owen, Young, Lawrence, & Compton, 2007). Ease of access to multi formats of representation enables students to choose content and the way in which it is presented. For instance, aural learners may choose to include spoken reflections, whereas visual learners may prefer to represent their learning journey in diagrams or images (Owen, 2009).

Methodology

The research study conducted in Higher Diploma Foundations (HDF) at DMC was qualitative in nature with the aim of producing rich data for the specific educational context (Hoepfl, 1997), while also gathering attitudinal and evaluative feedback (Silverman, 2001). Because I was already closely involved in the learning community, participatory action research offered the most suitable approach, as it enabled me to act as a participant as well as a ‘research instrument’, had a cyclical format, was focussed on producing informed change, and included input from stakeholders (Lau, 1997; Wadsworth, 1998). The study was conducted over a three-year period (2003 to 2006) with one research cycle completed each semester.
The aims of the study related to e-Portfolios were to investigate whether changes made to the initial ePortfolio design (described below) were effective, to make recommendations as to whether e-Portfolios should continued to be utilised, and to explore stakeholders attitudes toward the use of e-Portfolios. Research questions included:

- What effects do the development of an e-Portfolio have with male, Emirati students entering a tertiary level learning community?
- What are the attitudes of stakeholders toward the development, use, and maintenance of student e-Portfolios?
- What are the attitudes of students who have participated in the Computer, Research Skills and Projects (CRSP) course, toward developing e-Portfolios?
- What are challenges and barriers to using e-Portfolios?

Data was collected in the 2003-2004, 2004-2005, and 2005-2006 academic years. Study participants were HDF students, academic faculty teaching on the CRSP course, supervisors, and academic faculty teaching content courses. Data collection tools included interviews, focus groups, surveys, observations, statistics from the Learning Management System (LMS) WebCT, assessments, and documents associated with the CRSP course. Online questionnaires were administered at the beginning and end of every semester (for academic faculty and students). Focus groups were also administered with each of the ten to twelve classes. Informal verbal and written feedback was actively encouraged and gathered frequently (usually anonymous). Changes were made as soon as possible, so students and teachers could observe the results of their contribution and its result.

The quantity of data that has been collected, collated, analysed and interpreted is substantial and reference is only made to results and findings when they bear relevance to e-Portfolios.

**Education Setting**

All Foundations students at DMC are Emirati male nationals, whose first language is Arabic, and the majority of whom are between the age of seventeen and thirty, with approximately 10% of mature students also employed in full-time jobs. All were planning to...
continue their study in vocational areas such as media studies, business, IT, aviation, and engineering. To enrol on the Foundations programme it is mandatory for students to purchase laptops, and the college was equipped with wireless connectivity. The aim was to facilitate 'anytime, any place' lifelong learning as well as integrating the use of laptops within a learner-centred curriculum.

Prior to college entry, most of the students in the HDF learning community at DMC have been educated through strategies such as rote memorisation (Smith, 2001), and tend to be reliant on the teacher as a source of instruction and knowledge. Frequent assessments are usual and may not be accompanied by feedback. As a result of the combination of some or all of the factors listed above, many Arab students enter tertiary education with little or no understanding of the conventions of tertiary education (Harrison, 2007; Owen & Madsen, 2008). For DMC students, the majority of whom are direct entry from high-school, to adapt their whole approach to learning, alter their expectation of themselves as learners and of the role of the teacher, and also adjust their way of thinking, is an essential but challenging process (Owen & Durham, 2007). However, during this transition it is paramount to provide enough support for learners to develop the strategies that enable them to assimilate the necessary research and study skills, along with critical, evaluative and analytical skills, (Murchú & Muirhead, 2005) that will enable them to study at higher diploma level.

**E-Portfolios at DMC**

Prior to the integration of the e-Portfolio initiative into the CRSP course an alternative approach to e-Portfolios had been trialled. The aims of this e-Portfolio trial were to:

- Encourage learners to develop creative, visual and authentic collections of artifacts;
- Encourage collaboration and peer feedback;
- Assist learners to identify the correlation between their study and Learning Outcomes (LOs) / Graduate Outcomes (GOs);
- Recognise gaps in experience or skills;
- Instigate a cycle of updating, reflecting upon and improving artifacts;
- Assist learners to set personal learning outcomes/goals;
• Encourage the collection of artifacts which become the basis of a professional ePortfolio;
• Provide a common framework within which learning and achievement are discussed and planned; and
• Create a student-centred, pro-active, empowering process.
  (Dawood & Godfrey, 2003)

The e-Portfolio design was based around HCT GOs and the collection of learners’ artifacts to demonstrate achievement of these outcomes. Student e-Portfolios were designed to be hosted on the DMC servers as individual Web sites. Students were briefed on the concept of GOs and some of the benefits and issues around e-Portfolios were discussed. Tutorials around the process were facilitated and an HTML template (see Figure 1) was provided in a zipped file through WebCT. Students were expected to move and modify the HTML files in the template using Microsoft FrontPage and link their selected work from English, Math, Arabic, Research Skills and Projects, and Computing to the appropriate GOs. The development of the e-Portfolios was seen as ongoing and would continue as long as the students were at the college.

During the trial a range of issues were encountered. For example, students found it challenging to interpret the GOs and link relevant artifacts to them, and many remained unengaged with the process. This was exacerbated by the lack of buy in from some academic faculty in Foundations who saw the e-Portfolios as an inappropriate add-on. Furthermore, academic faculty in the rest of the institution were not interested in encouraging students who graduated from Foundations to continue to develop their e-Portfolios. Based on these experiences an alternative approach to e-Portfolios was adopted which maintained the beneficial assets of e-Portfolios, but altered some of the processes, while increasing the scaffolding. The implementation was supported by a shift in focus in the Foundations department, whereby Research Skills and Projects amalgamated with Computing to form CRSP, and a programme review resulted in a general rationalisation.
In the CRSP course, students participated over 40 weeks, in two hours per week face-to-face sessions, as well as interacting through the synchronous medium of MSN and in the online WebCT environment. A range of activities and tasks were associated with four key projects: The Country Project, The Famous Person Project, The Career Project, and the Inventions, Developments and Change Project. The Career Project was the main period where students were given direct input and support around developing an e-Portfolio. What follows is a description of the integrated Career Project that was run in the first ten weeks of semester two. The tasks described were cumulative, completed at regular intervals throughout the ten weeks, and all contributed to the design and content of the e-Portfolio (see Figure 2).

**Task 1 – Vocabulary, autobiography and CV:** Initially key topic-related vocabulary was introduced, and set of associated activities facilitated including tactile tasks such as flash cards and board games. The vocabulary was essential in the writing of an autobiography, which was then distilled into a CV. The autobiography was designed to encourage students to recognise
informal learning, life-skills and experiences as valuable assets that should be included in their CV.

**Task 2 – Podcast and analysis Task:** Students completed a task that helped them select the specialisation they were going to study after they graduated from Foundations. Foundations students at DMC are not ready to undertake a quantitative process of multi-criteria decision-making, so a scaffolded approach was adopted to assist them (Moran & Owen, 2008). To help students identify and prioritise components, the CRSP team created a podcast and linked it to an analysis task in WebCT. The podcast was entitled ‘Career Considerations’ and included a recording of six DMC Foundations students who appeared on a local Talkback radio station, Dubai Eye.

![Figure 2: Integration into the CRSP curriculum](image-url)
Task 3 - Using MS Excel to organise and display authentic research data: Students completed a collaborative ‘off-campus’ task, which required them to interview people in the workplace and gather data on employees’ occupations, skills, training and education. They then collated and sorted the data, and used MS Excel to produce graphs that display, for example, the representation of nationalities working in the public and private sectors. In addition, students were asked to answer questions about the hypothetical consequences of the collected responses in connection to their respective career decisions and where their specialization choice may lead them. For that reason, the task was specifically designed to encourage the use of critical thinking skills and to exploit the use of technology in displaying and formulating data. As Collingham (2005, p. 19) points out, “the development of language or number skills does not take place in a vacuum, but in response to the contexts, educational or otherwise, in which we find ourselves”.

Task 4 - Interactive Web-based simulation activity: Information provided by the academic and technical departments at DMC was used by the CRSP team to script scenarios which required students to simultaneously read and listen to information about different hypothetical students and the course options available to these students. They then had to analyse the various options, and, using a list of key considerations, decide which course was best suited to the hypothetical individuals. Also included was specific information about the job opportunities available following graduation from DMC. However, because students did not possess a sufficiently detailed understanding of the UAE government’s policy of Emiratisation, Task 4 included tasks that required them to research the policy.

Task 5 – Group presentation: Students formed groups of three or four and then selected from a list of topics that ranged from the steps for writing a Curriculum Vitae (CV) to a career that group members were interested in. Using research data they had collected (using research skills, resources and evaluative strategies), along with strategies they had learned as part of career workshops and department presentations, students created a PowerPoint and prepared a formal ten-minute presentation that they delivered in front of their peers.
**Task 6 – e-Portfolio:** Using Macromedia Dreamweaver, MS Picture manager, MS Excel, and (where students have the skills and the inclination) Macromedia Flash, Adobe Photoshop, and other multi-media software programs, students designed and developed an ePortfolio Web site which included a CV and autobiography, an overview of the course they wished to study and associated career, the collated data, summary and interpretation of the interviews, and a reference list.

**Results and Discussion**

This section opens by referring to specific findings from the research study including benefits and drawbacks of the e-Portfolios used with DMC Foundations students. A discussion of how these findings have since helped inform practice at Unitec NZ, along with some relevant implications from the findings, conclude the section.

Feedback collected from interviews, focus groups, and surveys with students and academic faculty can be divided into three key categorical statements, with supporting sub-themes:

**Skills acquisition and future application**

- Students comprehended the e-Portfolio, when fully integrated into the CRSP course, as having real purpose (i.e. adding to skills that they will use in further study and in their careers), while also enhancing their ICT skills.
- Applying concepts and skills learned in core Foundations courses to authentic tasks, coupled with integrated assessment tasks was motivational and constructive;
- The integrated CRSP programme approach was considered effective at fostering research, study, and critical thinking skills acquisition;
- E-Portfolios were valuable for making decisions / planning for future career(s);
- De-motivation was expressed because there was awareness that the continuing development of the e-Portfolio was unlikely to occur once students had graduated from Foundations;
Skills acquired in the HD Foundations CRSP course (in particular through e-Portfolios) were applied by students who graduated to Higher Diploma;

Academic faculty indicated that knowledge transfer from life experiences and previous education was encouraged through e-Portfolio development (especially through reflection and peer feedback); and

Potential employers need to be involved in helping to identify the requirements for e-Portfolios.

Recommendations from stakeholder feedback were implemented as part of an iterative approach and therefore resulted in further incorporation of skills, recycling of key concepts and vocabulary, as well as an increased focus on integrated assessment. In addition, because CRSP objectives were dynamically related to other disciplines, students developed new understandings about communication, ICT and its wider application.

Employers can be considered stakeholders in the tertiary education process (even at the early stage) in so far as education needs to lay the foundations for students to one day be successful employees. UAE businesses had been invited to input into the design of the e-Portfolios and to give feedback around the results. However, uptake was negligible, although students who showed their e-Portfolios during visits to businesses anecdotally reported positive responses, and one student was offered a summer placement during one such visit.

**Support, scaffolding and administration**

- Some students (72.7%) indicated that if the ePortfolio had not been compulsory they would not have developed one;
- Time commitment was identified as an issue, with academic faculty indicating workload as a problem;
- The production of a diverse range of ‘authentic artifacts’ was stimulating;
- When task completion expectations were high students were ‘challenged’ by these expectations and produced higher quality artifacts;
- Practical and technical problems were frustrating but these were accepted as an integral, albeit negative, aspect to using technology;
• ICT skills required to build the e-Portfolio were manageable;
• Dreamweaver, and the associated task, were sometimes seen as restrictive;
• There were few problems encountered accessing necessary connectivity and technology;
• The vast majority of students (93.8%) believed that the CRSP WebCT LMS site was a good way to access scaffolding, information, tools, examples, models, and time-management assistance. In particular, the Camtasia videos were used extensively by the majority of students (85.4%), as well as by academic faculty; and
• A minority (15.2%) of students would have preferred to use paper-based resources.

Although it is impossible to state that e-Portfolios had a direct impact on graduation results from CRSP, the following results were recorded. In the first year e-Portfolios were implemented, the failure rate increased from the previous academic year. However, there was a large increase in the achievement of A and B grades. This trend continued except for the 2005-2006 year where the failure rate was again observed to have increased. However, this appeared to be an anomalous year as the pass rate of graduates from ENGL070 and MATH070 were also low for that cohort. Furthermore, even in a year where the intake displayed a comparatively low pass rate, CRSP still successfully graduated 80% of students, with 49% achieving either an A or B grade. The CRSP integrated programme approach helped address issues around mixed skills level groups, because, with the use of tools such as Camtasia videos, students were able to work at their own pace, in a self-directed manner, outside of class. Thus basic skills were learned, freeing up the instructor to facilitate a wider range of concepts and skills and maximising the support offered to more challenged students. This suggests that the use of strategies and scaffolding that recognise that there is a variety of learning preferences (discussed in detail in Owen, in press) and skill levels is highly effective in teaching required concepts and ICT skills. CRSP in general and the e-Portfolios in particular, were therefore effective in extending the more advanced students, keeping them interested and motivated throughout the academic year.

Affective factors
• Students enjoyed having creative control over the appearance of their e-Portfolio, the artifacts they chose, and the multimedia they included. They also found it motivating to be able to share the e-Portfolio;
• Most students preferred to work in groups; and
• The college environment was often more conducive to study as opposed to studying at home.

Creativity was identified as important; however, an issue that was identified was that the computer component of CRSP required the use specific applications and associated skills to be mastered (Godfrey, 2004). Furthermore, Web 2.0 tools were not an option as many of the sites were blocked by the telecommunications operator for the UAE, Etisalat. However, with integrated e-Portfolios students who wished to use applications such as PhotoShop, and other multi-media applications to create artifacts were encouraged to do so. Marking rubrics (that focussed on the process as well as the product) were written with enough flexibility to recognise such creativity.

There was a strong correlation between course work completion and success in the final exam - those students who were motivated to attend classes and complete the course work, passed the course. More interestingly, there is also a correlation between the CRSP grade achieved in the overall course work and the exam grade (on average only a 5% or less difference). However, one problem was student reluctance to complete homework or assignments outside of the classroom, and to submit original work on time. Research carried out in the public high-school system (Owen & Godfrey, 2007) revealed that homework is rarely assigned to students, or it is assigned with no expectation that it will be completed. Alongside direct support around time-management and planning skills, and the introduction of a strict late policy, e-Portfolios were introduced. The affective factors that underpinned the development of the e-Portfolios appeared to prove motivational for students. As their creative, feedback, reflective and ICT skills developed, so, often, did their confidence and ‘voice’. The sharing of their story through activities such as writing autobiographies was the first step toward recognising informal as well as formal learning as important. In addition, results indicated that
on average, student submission of homework on (or close to) the deadline improved by 65.7%. Hence, it appears that the combination of strategies, policies, and incremental, cumulative tasks that are broken into steps with an associated completion grade, allowed plenty of opportunities for timely formative feedback and reflection.

Findings from observations suggested that students were empowered by the blended approach that the CRSP course used, and some students’ responsibility for their own learning increased. In other words, students were introduced to skills and strategies, which they then applied, and as such the level of experiential learning was extensive. Guided reflection helped learners focus on the process of creating artifacts and using them in their e-Portfolios, whereby through use of accessible rubrics, discussion, and peer feedback students began to develop time-management, problem solving, critical thinking and evaluative skills. For example, by completing collaborative activities with transparent, specific objectives and direct relevance to their e-Portfolio students became aware of the importance of audience, how to present information and findings for a purpose, and how to constructively reflect upon, and receive feedback, either synchronously or asynchronously, about the artifacts they had produced.

Discussion and Implications

Murchú & Muirhead (2005) suggest that it is no longer sufficient for graduates to be well-versed in ‘course specifics’, but that it is also vital they can demonstrate advanced levels of literacy and critical thinking skills. In addition, the Ministry of Education in the UAE now advocates active, skills-based syllabi that meet the evolving requirements of a ‘global’, international labour market (UAE Ministry of Information and Culture, 2006). The holistic, cumulative, experiential approach utilised in e-Portfolio creation at DMC appears to have been appropriate in the fostering of generic skills, as well as encouraging the transfer of skills to a variety of contexts (Skillen, James, Percy, Tootell, & Irvine, 2003). Unfortunately, restrictions around access to Web 2.0 tools in the UAE did mean that many of the benefits of using Web 2.0 e-Portfolios (see discussion in the literature review) could not be exploited. Furthermore, issues around cross-cultural awareness, portability and mobility in a global employment market, could only be explored in principle rather than in practice.
Overall, e-Portfolios were perceived as beneficial – although it was the process that was identified as most valuable as opposed to the end product. The main implications that were identified from the DMC study were that effective e-Portfolios needed to:

- Encourage learners (and academic faculty) to become familiar with the concept and value of e-Portfolios and reflection;
- Be context-related (including culture(s), tools, skills, potential careers);
- Be fully integrated into a curriculum;
- Have resources, guidelines, documentation, and tools available that scaffold the preparation of an e-Portfolio;
- Supply scaffolding in the form of models, examples, and support for the development of thinking skills and guided discovery, which support a progression toward greater competence, creativity and self-direction;
- Make rubrics available, accessible, and assessment transparent / relevant;
- Apply consequences for non-completion required documentation and discussion;
- Provide sufficient opportunities for feedback, reflection, improvement, resubmission, instruction and support, partly through incremental, ‘cumulative’ coursework;
- Be fully supported by academic faculty (who are also involved in the pre- and post-moderation assessment processes);
- Offer collaborative tasks that are part of real or simulated situations, with an authentic purpose, and that have elements of peer/tutor support, guidance and review; and
- Utilise learners’ prior learning and experiences to inform / structure self-regulated and goal-focussed learning.

It was, nevertheless recognised during the analysis and interpretation of the data that there were several further issues that had sometimes not been directly identified by participants, but which became apparent to the researcher. The limitations imposed by the way the ePortfolio had been set up, for example. Even though the main foci were reflection, skills acquisition, and career choice / planning, each step was assessed as was the final artifact. Peer feedback was limited to face-to-face sessions, instant messaging, emails or discussion boards; there was no way to enable students to directly add comments to each other’s e-Portfolios. The tool itself was
limited in that the resulting e-Portfolio either had to be hosted on the college server, or the student had to arrange somewhere else to host it. Also, ongoing updates could not easily be applied unless the student was au fait with, for instance, file transfer protocols and the skills required to synchronise Macromedia Dreamweaver with a site on a server.

Some instructors commented about workload and the time it took students to develop e-Portfolios, especially when students were so motivated by the task that they neglected other tasks in other parts of the programme. There were also questions raised about the appropriateness of Foundations students developing e-Portfolios, which were occasionally seen as something that should be used in a student’s final years. Academic faculty outside of Foundations were patchy in their uptake of e-Portfolios, citing as one of their reasons only a slowly building interest from employers. As such, it became apparent that it was essential to have complete buy-in from academic faculty who needed to comprehend the value of developing one on all levels, and to see it as an integral part of the programme and the learning journey. Without this support, some students would not be convinced of the value of developing an e-Portfolio, and it would only remain an exit requirement for Foundations.

With the factors above in mind, I relocated from the UAE back to Unitec NZ where I had the opportunity to continue working with academic faculty and learners around the use of e-Portfolios. At Unitec NZ, there is a combination of ages, ethnicities, backgrounds, levels of ICT literacy and access to ICT, and many students are studying on courses with a vocational focus such as architecture, vet nursing, horticulture, business, IT, boat building, and the built environment. Potentially, e-Portfolios have the flexibility and customisability to meet the diverse requirements of a variety of learners, in a range of life circumstances and careers. For example, statistically Maori and Pacific Island students are under-represented in all aspects of study at the tertiary level (Hau'alofa'ia Koloto, Katoanga, & Unafei Taila, 2006; NZ Council for Educational Researchers, 2004). One aim, therefore, was to offer options around the development of e-Portfolios such as those facilitated by Mobile Learning (m-Learning) and Web 2.0. As a result, courses with integrated e-Portfolios may enable learners to access learning experiences without having to take time off work, while also being able to fulfil their family or community commitments, thereby improving completion rates and professional progression.
Web 2.0 tools had the scope to offer ease of use, accessibility from most mobile devices (Cochrane, 2008), the possibility of collaboration, informal learning and peer input, and other benefits such as authentic access to experts in the discipline and/or profession. Furthermore, because Web 2.0 e-Portfolios can be created and developed by any New Zealander with access to the Internet, opportunities for access to lifelong learning are increased.

Working alongside colleagues who had already begun initiatives and research in this area, some key questions were identified:

• Who can potentially use e-portfolios for teaching and learning?
• How can e-portfolios be used to support student transition to the workplace?
• How can e-portfolios be used to support career promotion and migration for established practitioners?
• To what extent can e-portfolios be utilised to support learner/practitioner interactivity, collaboration, communication, reflection and interest?
• To what extent can e-portfolios be used to maximise the benefits offered by current and emerging ICTELT technologies, especially when underpinned by sociocultural principles?
• To what extent can e-portfolios be used to engage reluctant learners / non-traditional learners / work place based learners and thereby form a source of life-long learning opportunities.
• How effective are e-portfolios in supporting applications for work?

Research specifically around the effectiveness of e-Portfolios at Unitec NZ is not extensive (although Cochrane, 2009, is conducting ongoing research into the effectiveness of m-Learning and Wireless Mobile Devices). To date, anecdotal successes have been encountered. For example, showcasing potential – in 2007 a student on the Boat Building Programme made his Web 2.0 e-Portfolio openly available on the Internet. It was seen by a company in the US who offered him employment. Furthermore, students involved in the Landscape Design Programme who used e-Portfolios to collect, reflect and plan their projects were awarded Gold and Silver for their designs at the internationally recognised Ellerslie Flower Show in 2007. Other feedback around the process includes students from the Bachelor of Product Design
programme who feel empowered by the flexibility of multimedia where, for instance, they can make audio recordings of their reflections, and who state that, if it had been a paper-based portfolio they would not have completed tasks. There was some level of anxiety expressed by learners at the start of e-Portfolio initiatives, but this tended to dissipate once understanding of purpose and a level of comfort were achieved. Collaboration with peers and tutors appears to be enabled by utilising a combination of Web 2.0 e-Portfolios and m-Learning.

Academic faculty reactions, though, have been mixed, with some stating that they could not see the purpose of e-Portfolios, or that it was too difficult or not relevant. The shift to a positive attitude appears to need time and reinforcement; for instance, Cochrane (2009) found that it was necessary to integrate the use of m-Learning into tutors’ daily work life, where formative comments were posted regularly to learners’ e-Portfolios. In addition, they were encouraged to use instant messaging and micro blogging to respond to learners’ questions when they were available online.

**Synthesis**

The findings from the DMC research study clearly illustrate many of the benefits of using e-Portfolios, as well as some of the drawbacks. In particular, the e-Portfolio has the potential to be authentic in purpose and format, while also providing an initial safe ‘working’ forum for experimentation, which in turn may be assessed. Activities have to be designed, however, to scaffold learners in their e-Portfolio ‘journey’, and discuss anxieties and considerations around using e-Portfolios. In addition, ICT and communication skills can be enhanced.

Reflection by the researcher following the study at DMC, however, included revisiting the ethos underlying e-Portfolios, resulting in a shift to seeing them as lifelong, organic entities that an individual develops throughout their education and later in their communities and workplace. Feedback and comments on e-Portfolios ideally need to include peers as well as educators, experts, and other interested stakeholders from around the world.

Experiences at Unitec NZ to date suggest that using activities underpinned by Sociocultural principles, along with Web 2.0 tools provides multi-faceted forums, with
opportunities for collaborative development, private reflection, and showcasing achievements. Learner creativity and autonomy can be encouraged through personalisation of learning spaces, and the adaptability and portability of format have the scope for use by professionals already in the workplace, as well as for students studying full time. Learners in turn can explore notions of appropriacy, audience, and communication.

**Conclusion**

This paper has presented findings from research conducted at DMC in the UAE, and the impact that those findings had there and subsequently at Unitec NZ. The study was designed to offer a rich, descriptive insight into the implementation and use of e-Portfolios, which would be applicable to the education context. However, the collation of feedback from stakeholders holds relevance to other educators, administrators and managers making decisions around e-Portfolio initiatives. Furthermore, the study helped identify key factors that contribute to the effectiveness of e-Portfolios as possible learning and lifelong learning tools, including:

- Ensuring clarity of purpose;
- Opening dialogue with learners;
- Supporting / encouraging academic faculty;
- Working across sectors;
- Enabling / valuing casual and peer learning;
- Selecting tool(s) that are easy to use, but sophisticated enough to enable creativity/personalisation;
- Integrating into curricula / assessments;
- Using frequent, meaningful feedback from tutors and peers;
- Aligning / designing / refining using LOs and agreed graduate profile;
- Providing pedagogical / ICT support;
- Raising learner awareness (LOs/skills); and
- Choosing tools that empower not fetter.
Further study is required before dependable recommendations can be made about the effectiveness of integrated e-Portfolios, especially where Web 2.0 tools are used. The data collected as part of the DMC study, nevertheless, appear promising.

Education institutions wishing to adopt e-Portfolios, especially those using Web 2.0, before instigating active initiatives need to draft an e-Portfolio policy that states the ethos informing the institution’s decisions. Resourcing, support and scaffolding for administrators, academic faculty and learners also need to be factored in, because without buy-in e-Portfolio initiatives run the risk of becoming time consuming activities with little associated learning. Openness, ownership, collaboration, and sharing can mean different things to different people, and any statement around these aspects needs to interface with the institution’s culture and the limitations in which it has to operate, as well as being suitable for the communities that it serves. As such, an institution needs to conform to national standards around e-Portfolios, while also being aware of associated legal and cultural issues around aspects such as privacy, appropriacy and accessibility.

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Empowering Disenfranchised Learner Identities through EPortfolios

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Abstract

To support VET participation, pedagogies need to recognize and respond effectively to the impact of the disparities between those students' realities and educational institutions’ assumptions about knowledge. This paper explores the potential of ePortfolios to recognise and engage diverse learner identities within formal education. The paper reports on the outcomes of a project that developed and utilised ePortfolios with a range of Indigenous learners in vocational education contexts. The learners come from different remote and regionally based communities and explored ePortfolios and a range of different technologies, knowledge systems and the associated literacies. The outcomes are discussed in relation to representations of learners' identities through ePortfolios. The discussion considers the opportunities and challenges for utilising ePortfolios in Indigenous contexts and the vocational education sector.

Introduction

To support the participation of disenfranchised students, vocational education and training providers at an institutional and individual level continue to examine the systems, resources and pedagogies that can enhance the engagement and outcomes of those disengaged learners. The use of information technologies in learning and assessment have been promoted as a part of the solution. In the assessment of evidence that utilises digital technologies, there is a need to identify people and learner driven systems that effectively engage a range of learners.
Electronic portfolios (ePortfolios) provide a way of organising digital based evidence. There are a number of challenges for learners, trainers and educational institutions when considering the use of ePortfolios to engage disenfranchised learners. EPortfolios can utilise a number of different structures and draw on a range of learning knowledge management approaches to support learners’ engagement in education and recognition of their competence. This paper discusses the experiences of using ePortfolios with Indigenous learners to improve Recognition of Prior Learning (RPL) processes.

The paper seeks to identify the pedagogical and systemic considerations in using ePortfolios in the vocational sector with Indigenous learners. The considerations include the collection and organisation of digital evidence for the learners’ own purposes and assessment of their competence, the development of an ePortfolio system and interface that are aligned with Indigenous learners’ preferred ways to represent information. The systems, approaches and resources utilised was centred on learning from the learner’s perspective. Secondly, the approaches and resources addressed the ways to organise information to facilitate assessment against nationally accredited qualifications. The development of a learners’ community of practice supported their engagement in building the skills and ePortfolios for effective RPL. The leadership by Indigenous people in all aspects of the educational process was essential to improve the use of digital technologies to develop evidence in meaningful and sometimes innovative ways. Finally the chapter identifies some of the challenges in developing and implementing RPL processes that utilise ePortfolios.

The author acknowledges all of the Indigenous and non-Indigenous partners involved who have generously shared their ideas, learning and experiences.

**Significance**

The National Strategy for VET 2004-2010, *Shaping Our Future (ANTA 2004)*, identified that at the core of vocational education in Australia was ensuring Indigenous Australians have the skills for viable jobs, a shared learning culture, increased business development, and
employment opportunities that lead to greater economic independence where employers and individual are at the core of VET. Over many years, high numbers of Indigenous Australians have participated in VET training, however, a much lower percentage have had positive results in relation to employment or higher level qualifications (Australian Bureau of Statistics 2008). There is an urgent need to improve the recognition of educational achievements and the experience of formal education by Indigenous learners. Miller (2005), Young, Roberston et al. (2005), Young, Guenther et al. (2007), Gelade and Stehlik (2004) have identified some of the issues hindering the provision of training that can improve the educational and workforce outcomes of remote Indigenous adults. These issues include a lack of culturally appropriate learning approaches and learning resources utilised in VET teaching in remote communities. The *Djama in VET* (Henry, Arnott et al. 1998) study identified six interconnected issues in VET delivery with Indigenous communities that, if addressed appropriately, contribute to improving the outcomes from VET delivery in Indigenous contexts.

Training programmes improve Indigenous educational outcomes when Indigenous people are engaged in educational design and delivery, Indigenous community’s culture and knowledge are completely integrated and the relevant community has control over all aspects of VET delivery. Wallace and Boyle (forthcoming) note training needs to be matched with current and developing work, embedded into community and community business, and preferably taught by Indigenous trainers. Campbell and Christie’s (2008) recommendations to improve Indigenous community engagement in formal education, identified the importance of respect as identified by Indigenous participants, good communication based on respect and trust, long term engagement of institutional staff and the involvement of a network of organisations from the industry, governmental, community and education sectors. The development of training programmes in Indigenous contexts must be underpinned sound institutional, and educational approaches that support the effective engagement of Indigenous people, knowledge and their partnerships with educational institutions.

The Council of Australian Governments (COAG) has identified the importance of ensuring the training system, and the products of the training system, are responsive to the needs
of individuals, businesses and industry. In the vocational education sector there is considerable scope to support ‘learner transitions and key national policy drivers such as RPL and fast-tracking apprenticeships’ (DEEWR 2009; pp. 7). Eportfolios have been promoted as improving outcomes for teaching, learning and assessment as part of a lifelong learning approach in education (Lorenzo and Ittleson 2005, JISC 2008). The potential of ePortfolios in the Australian Higher Education sector has been examined through the Australian E-portfolio Project (Hallam et al 2008) which recommended that ‘government policy recognise ePortfolio practice as a strategy to build an integrated relationship between higher education and the vocational education and schools sector, in order to support the individual’s lifelong and lifewide learning needs and to increase the potential for career progression’ (Hallam et al 2008; pp. iv). They note and that as Australia is in the early stages of ePortfolio adoption, there is an opportunity to understand how ePortfolios impact on educational outcomes.

Boyle and Wallace (2008) have explored the steady uptake of Information Communication Technologies (ICT) in adult education in Indigenous contexts. Use of ICT was holistic; ‘framed and based in Indigenous students’ experiences and knowledge systems’ (p9). ICT pedagogies provided ways for Indigenous students to manage and record their knowledge and skills in accordance with the relevant Indigenous and personal governance structures while also meeting formal educational standards. Teachers and Indigenous community members customised the content and use of ICT for local learning purposes. Through lessons, Indigenous people developed confidence in accessing, using and innovating with emerging technologies and build networks across communities of practice and distance. Trainers were able to utilise ICTs to embed English literacies and numeracy development into learning and sharing all learners expertise; that of teachers, students and community members. In this way the control of learning is shared and supports co-production of knowledge within appropriate and critically aware cultural and social contexts.

Literature review
Definitions of ePortfolios have developed as their use has diversified and deepened. The definitions are based on the purpose, product or systems. Eportfolios, as a product, are a collection of digital artefacts articulating experiences, achievements and learning’ (JISC 2008). Eportfolios are a digitised collection of objects from a range of sources that include resources, achievements, responses through text, visual, graphics, reflections, multimedia artefacts or examples that are organised to share information and gain learners’ feedback (Lorenzo and Ittelson 2005, JISC 2008). Acker (2005) describes ePortfolios in terms of being student ePortfolios, teaching ePortfolios and institutional ePortfolios. Eportfolios have a range of different purposes; to collect the evidence to apply for employment or admission to a course, present an overview of learners’ achievements and support their transition to a new environment, support learning processes through reflection and discussion, the collection of evidence for formative and summative assessment, and, for personal and professional development (JISC 2007).

The VET E-portfolio Roadmap notes the shift in the definition of ePortfolios (DEEWR 2009 pp 2-3) to one that focuses on what the ePortfolio does. This definition extends the concept of ePortfolios to being learner driven, supporting lifelong learning, enabling documentation and reflection on learning and an e-portfolio system that provides services for learners to create, maintain or present their e-portfolio’ (DEEWR 2009; pp. 3). The Roadmap describes ePortfolios as used to support the mobility and transitions within students’ plans, reflections on career development and learning, recognition of learning and skills, verification of qualifications, recording employability evidence and controlling private information (DEEWR 2009; pp. 2-3).

The uses of technology have developed with their technological advances and, as Kress and Pachler (2007) note, the incorporation of a range of devices into many peoples’ social and cultural practices. The use of digital media organised through a system like an ePortfolio provides an approach to incorporate learners’ and work contexts. Eportfolios have been found to engage learners through scaffolded tasks and that ‘most learners gain confidence through developing ePortfolios, and many acquire a greater sense of self-worth.’ (JISC 2008; pp. 11). They provide a framework for learners to present and engage in learning experiences that can
create

‘new possibilities for how people relate to each other, how knowledge is defined in negotiation
between actors and changes our conception of learning environments in which actors make
meaning’ (Erstad 2008; pp. 181).

Effective ICT learning and engagement is more than the technology and associated
technical skills. The role of digital technologies in improving the educational opportunities for
Indigenous learners is dependent on the ways they are used and connected to people’s own lives
and purposes. Beetham (2007) notes that technologies should not be included in learning
situations without understanding participants’ competence and confidence in using technologies
and ideally extend that competence to build bridges to learning new skills and knowledge. The
ways people learn is based on reflecting on their own cultural models of the world that do not
denigrate their identities, social connections, strengths or contrast them to new models (Gee
2003).

83), notes that their use is not ‘predetermined, it develops in relation to the context, and that
through use they are reinvented and configured in response to agendas arising from the context’
and are only useful when ‘revived on new contexts of knowledge production in active, creative,
situated negotiated encounters’. Engaging approaches embed Indigenous knowledge and
perspectives and encourage students to explore the potential of ICT to accurately express their
ideas, knowledge and skills. Field (2005; pp. 1-2) noted the value of recognising ‘the complexity
and diffusion of lifelong and lifewide learning (is a concept that is not )…easily absorbed by
more conventional education and training systems’. Jarvis (2004; pp. 16-7) notes the inability of
education institutions to maintain pace with the society’s new demands, meaning much learning
occurs outside the education system in unplanned ways. This learning, if recognised, can
improve educational delivery and be connected to formal educational experiences to build
bridges to learners’ contexts and perspectives.

Falk and Balatti (2003) have indicated that a link exists between education and identity,
that learners are affected by the ways they understand or define themselves, usually called identity and described aspects of identity in learning. Understanding the key factors of learning engagement that impact on the different learner identities is dependent on understanding the identities on which individuals draw and the efficacy of those identities in negotiating new learning experiences.

Learning opportunities that build empowered learner identities by relating to disenfranchised learners’ social practices and group memberships may build bridges between students, educators and communities’ understanding of each other’s knowledge and learning practices and identities (Wallace 2008, 2009). These are informed by the different learning identities as they relate to peoples worlds; family, local, institution, workplace and global communities. As Gee (2003; pp. 51) notes, learning is connected to accessing and exploring a range of identities as a learner ‘it requires taking on a new identity and forming bridges from one’s old identities to the new one.’

Developing identity affirming learning experiences can support regional students and communities’ identities. If the educational system operates from a view that assesses what people coming to learning do not have – a cultural deficit view – their knowledge is not being recognised. The deficit view of students’ knowledge actively disempowers teachers and students, reducing their opportunities for learning. Effective approaches to e-learning also recognise the impact of learners having a learner identity that supports engagement in formal education and promotes strong connections between learners and educational institutions’ worlds and ways of managing knowledge. This kind of approach can reduce the risks of engagement to learners own community membership and support learners and educational institutions to build the strategies that encourage and sustain active engagement in formal learning. (see Wallace 2009 for more detail).

**Methodology**

This project utilises critical participatory action research approach. Participatory
research, a form of social research, has been associated with social transformation and is characterised by ‘shared ownership of research projects, community-based analysis of social problems and an orientation toward community action’ (Kemmis and McTaggart 2005; pp. 560). Participatory action research is a social process that studies, frames and reconstructs social practices through self reflection. Participative action research draws on Freire’s (1979) theories of emancipation (Marshall and Rossman 1999). Critical participatory action research involves a series of self-reflective cycles that include:

- planning a change
- acting and observing the process and consequences of the change
- reflecting on these processes and consequences, and then
  - replanning
  - acting and observing
  - reflecting, and so on. (Kemmis and McTaggart 2003, p. 381)

Higgs, Fish and Rothwell (2004; pp. 98) described a participative process to recognise practitioner knowledge that makes sense of observations and ideas through a ‘number of interactive, spiralling, reflexive, cognitive and communicative processes and actions (which) can usefully contribute to knowledge development’. Higgs et al’s framework commences with the formulation of an idea and then develops an understanding of the concept or event. The evidence base for the knowledge is generated through evaluation and critiquing that result in a sense of conviction or validation of the knowledge. The concept is then released for public critique so that it can be accepted and developed through interaction with the broader professional community (Higgs et al 2004; pp. 97).

Within a participatory approach, there are two sets of information that need to be recognised. The first is the set of experiences of the participants as learners and participants in the formal and non-formal education sectors. The second is the set of researcher’s own self narrative understood in terms of a relational identification (Chappell et al. 2003), a reflexive process where a life experience or history that is interpreted in relation to the social and cultural definitions of identities. This approach to data collection was utilised throughout the project and
drew together the reflections of participants and facilitators in the workshops, assessment sessions and feedback to the resource. The results were examined using thematic analysis to identify the common elements that impacted on Indigenous learners’ outcomes. The analysis discussed and described how successful resolutions to some complex issues were achieved and provided examples of innovative practice.

**Context**

This project was undertaken in 2007 and 2008 with Indigenous learners and vocational education providers in the Northern Territory and the Kimberley region of Western Australia and aimed to develop effective e-learning approaches to recognise learners’ knowledge and strengths. This Australian Flexible Learning Framework, Indigenous Engagement-funded project was titled Working from Our Strengths: Using e-learning to recognise knowledge and competence in Indigenous enterprise training and development. This project approach emphasised the use of strengths based (as opposed to deficit based) approaches to learning. The project team included three facilitators and 15 participants and used e-learning tools and technologies to support Indigenous people employed across a range of Indigenous organisations to develop training plans with their current and potential staff. The participants had all completed a qualification in their particular industry area such as children’s services or business and wanted to undertake the Certificate IV in Training and Assessment to support their careers and to be qualified trainers in their organisations.

The project aimed to collect evidence using e-learning tools for a minimum of two units of competency from within the qualification per participant. The approach established effective processes using digital technologies to recognise the knowledge that Indigenous people have developed through working in different roles and industries. Participants undertook the RPL and current competence (RCC) process using digital photographs, videos and stories, ePortfolios and networking. The final product outlined the process for developing a training plan with an Indigenous enterprise team, ways to use e-tools to collect evidence to apply for undertake RPL and RCC and examples of successful e-applications for RPL and training plans.
Results and Discussion

Effective ICT learning and engagement is more than the technology and associated technical skills. Engaging approaches embed Indigenous knowledge and perspectives and encourage students to explore the potential of ICT to accurately express their ideas, knowledge and skills. This was evident across the project.

The project started by considering a range of e-learning approaches, mobile learning (m-learning) strategies and resources were found to be most useful. That is, using mobile technologies such as mobile phones, digital cameras, laptops, and USB sticks to collect and organise information in learning contexts. The projects were based in remote Indigenous communities and were best managed by collecting and organising information with people, while they were involved in relevant work-based learning activities.

In low ICT infrastructure and support environments, it was beneficial not to rely on complicated technology and instead, use approaches that can work anywhere, anytime. M-learning approaches, such as using laptops and cameras were less intrusive and already integrated into people’s daily lives, even if they were not used regularly by participants. M-learning based evidence collection strategies ranged from making digital stories and audio files to collating images and texts from various sources. Once these were accepted by students as a useful way to collect evidence, people identified a broad range of ways and places to collect images and examples. Participants used m-learning tools and associated learning strategies in ways that were familiar to them. Commonly, peer teams collected evidence for each other in their own workplaces and reflected on the images and recordings before remixing the information for presentation to the assessor.

Collecting digital evidence

Participants explored a number of digital technologies to collect evidence about their
skills and knowledge for assessment. The key features that were successful were; to use hardware and software that was intuitive and did not require a high level of technical expertise to use; using those technologies in teams; and, being able to share with peers. Although all participants had access to computers at work, and some also at home, Internet access varied considerably. This approach resulted in a collection of different learning objects that drew on a mixture of visual, audio and written elements to presented as evidence of their knowledge and skills. It was important for learners to be able to collect their evidence in teams so they could help each other recognise their strengths and interview each other about the reasons they worked in certain ways: the underpinning knowledge. The learning objects used digital stories, audio files, photographs and scanned and written documents. The use of visual and context specific materials assisted the assessor to elicit further information about their competence as they had a common reference point.

Participants examined a number of different ePortfolio systems and then designed an approach that they preferred. The features of the ePortfolio system chosen, demonstrate the central issues in designing an ePortfolio that engages Indigenous learners and provides an effective link between learners and institutional processes. Learners wanted engaging learning experiences that respect Indigenous knowledge and people, encouraged critical thinking rather than compliance, valued their knowledge and contexts, built learners’ knowledge of the system and supported learners growing independence in the VET system.

*An ePortfolio system and interface*

After examining a range of open and closed source systems, the ePortfolio system chosen used a USB drive to organise and store the information. This may be better described as an mPortfolio (mobile portfolio). This was chosen as learners could; retain a high degree of control of their information; focus on their perspective rather than the institution; adapt the system to their needs and priorities; and, they could decide what was shared and when. Large scale institutional systems were complicated and alienating. Learning complex systems to undertake
simple tasks such as creating a personalised page or linking images and text interfered with their learning and presenting their learning objects.

An interface had to be developed that made sense to learners, was sufficiently basic to make it easy for the learner to manage and facilitators to support them and, provided a point for assessors to be able to access the material prepared for them in a way that made assessment clear and explicit. The provision of exemplars and templates that could be adapted assisted learners access the technology. With advice from the learners, a splash screen styled view was developed that organised the material. It focused on the learners’ perspective and used a commissioned piece of Aboriginal art to navigate the sections. The view had the following areas:

- **My plan** - that outlined the study plan from the learner as it related to their career planning.
- **My media files** - in these section learners could ‘dump’ their materials without working out exactly where it belonged. This was the collection point for making decisions about relationships at a later and repeated stage.
- **My evidence** - in this section learners made a file for each unit of competence that they were collecting evidence for. Files could be moved to the appropriate folder and linked to multiple folders at any time.
- **My study history** - this was a place to collect all previous statements of attainment, student records and assessment items for later mapping.
- **My work history** – this was place to collect a resume, templates, references and any position descriptions.
- **My units** – in this section, learners downloaded the units of competency and associated materials from the National Training Information Service (www.ntis.gov.au) for which they were applying for recognition.

This structure allowed learners to separate their own material from that of formal educational systems. It then provided a point to connect the two when people were ready. Regular backups onto CD-ROM were encouraged. This interface did not require extensive discussion with information technology support which could be alienating to learners.
Community of practice

Learners developed a community of practice to support the development of their ePortfolios. They had a place that was private until they were ready to share it, and no one could access their information before the learner made that decision. This was very important to people. Learners worked alone or in pairs. They met regularly and were able to share some of the information they had collected. Learners were also able to discuss how they had mapped their evidence to the units of competence from the certificate IV qualification. This encouraged extensive professional discussions and provided a sounding board for people to affirm their decisions and for others to encourage them to clearly elucidate their skills. They shared with the others in the group and adjusted their ePortfolios accordingly. This was a source of inspiration for collecting evidence.

The community of practice collected evidence in ways that were not discussed during the initial sessions but were able to defend those choices as they had developed an understanding of the requirements of evidence. This also meant that there was space for the unexpected, the ways people had collected and could collect evidence that were not anticipated by the facilitators and could have remained hidden in an RPL process. This was an important affirmation activity that supported learners to sustain their effort. When they were ready, learners took the evidence organised into units that were ready for the assessor and had an initial meeting that was not an assessment but a feedback session that allowed learners to refine their portfolio prior to submission. This was another affirmation activity designed to further develop learners’ confidence in their work. The facilitators acted as advocates for students and were separate from the assessment process, thereby splitting these very different roles.

Indigenous leadership

An Indigenous VET lecturer was an essential part of the team. She acted as a mentor and trainer to develop an appropriate process for identifying and negotiating the participation of
people who were ready for and could utilize the qualification. She also worked with TAFE lecturers to share the learning and tools developed in the project. This Indigenous lecturer was central in gaining community support for the project and the involvement of participants in associated activities. She identified the different ways the technologies could be used, assisted learners to construct their ePortfolios, organise their information and prepare for their assessments.

Co-production of knowledge

The ePortfolios provided a place to collect multimedia evidence and the work with it, outside the control of the educational institution. People had a space to collect different perspectives of their home, community, cultural and work-based lives. They had time and space to reflect on what they knew and talk to the people with authority in their worlds, about how that knowledge should be managed and presented and its relationship to broader networks. People planned activities in their workplaces and recorded them to demonstrate their knowledge and answer the educational questions. The discussions around these evidence preparation activities and how they related to underpinning knowledge, performance criteria and units of competency was complex and led by learners. In this way learners led much of this project as it developed over time. Through this process, Indigenous learners were able to present themselves in a positive way when this had not been their usual experience of education.

Participants developed skills in using a range of digital technologies to represent their knowledge and skills within their own context. Participants prepared an ePortfolio of their evidence that was discussed with a training specialist prior to the formal assessment. Assessors found that the process changed their relationship with learners as they were able to see individuals’ strengths within their own context. The images and examples provided a productive starting point for a discussion about what learners did know and targeted the areas for further training. In this way training did not repeat areas of learners’ strength but focussed on the areas that needed development.
Challenges for the future

The ePortfolio system developed through this project is not meant to be, nor could it be a universal system for a large education institution. The ePortfolio identifies key features for learners who are often marginalised and could continue to be by institutionally-focussed ePortfolios. Eportfolios need to focus on the learners and their view rather than the institutions’ and provide a safe place for learners to share, varying levels of privacy, and a structured interface for institutional purposes such as assessment. Educational institutions need to provide the material that learners can take into their own ePortfolio and manage as they understand it. There needs to be spaces for learners to demonstrate their knowledge and experience in unexpected ways. Effective approaches to engaging Indigenous students in learning through ICT uses an awareness of, and explicitly teaches the critical literacies linked to use, production and communication through ICTs. ICTs are not a gimmick to trick students into learning; they have the potential to create strong learning partnerships between educators, students and Indigenous community members.

Eportfolio design and implementation needs to take advantage of and utilise the multimedia aspects of knowledge management rather than replicating the English literacy based resources in many flexible delivery programmes. One key resource could be the provision of how to guides for using ePortfolios and collecting evidence that could be dragged into an ePortfolio. The recently released PowerUpPlus resource [http://powerup.cdu.edu.au](http://powerup.cdu.edu.au) provides the ‘how to’ guides for using multimedia resources in Indigenous contexts. This is an opportunity to present information visually and in many languages, to connect ideas in different ways and to a multitude of learners’ contexts. This is a resource rather than a detriment for an educational programme.

Working in multimedia formats through ePortfolios is a challenge for teachers who prefer and are expert in written forms of communication and evidence. This student- centred approach is different and teachers/trainers will need additional time to adjust their approach, gain
experience and their develop their own communities of practice in which to share ideas. This needs to be a private space, like the one for learners, where people share ideas without being monitored for assessment purposes or fail as part of the learning process.

Learners need spaces where they can listen to others, share their ideas, negotiate meaning, get or test ideas, share information from peers without any assessment attached to that activity. This is a place to affirm learners’ identities and work in evidence collection. This flexibility allows learners to experiment with their own knowledge and learning before it is prepared for formal assessment. Learners need access to technology that is free and reliable, rather than the new and exciting technology that may take longer to learn and resilience and experience to master. For learners who have been excluded from learning, it is important to focus in being successful and on their purpose – to learn and achieve, not to become a technological master.

Interoperability is an important issue in the development of ePortfolio systems. Learners have information in many places and increasingly in mobile technological devices. The ePortfolio needs to have ways to facilitate rather than complicate connection in ways that are meaningful to learners. The systemic issues are complex, as the principles of adult learning, particularly those for marginalised learners and the principles of good information technology design need to be addressed. The partnerships of teachers and learners, working across different knowledge systems now has an additional challenge, to provide information in ways that are not culturally biased or exclude different ways of working.

Learners’ use of ePortfolios extends beyond the official life of an enrolment in a course. In the VET system this can be especially short (small units of competency are 10 hours long), and learners may prefer to be able to access an ePortfolio to collect evidence and participate in a community of practice long before they are ready to enrol. The cost involved can also be an issue. Indigenous learners would be better served by a lifelong approach to learning and ePortfolios that promotes the collection of evidence and development of expertise over time. This is a serious challenge for educational institutions and governments. A lifelong system will work better for marginalised learners with limited access to computers and Internet than multiple ePortfolios across different institutions. Finally, ePortfolios and the associated approaches to
learning with Indigenous people need to make space for the unexpected: the learners’ view that could not be anticipated by the developers or facilitators, or the view of people from different cultural and social groups.

Conclusions

The potential use of ePortfolios with Indigenous learners to recognise skills and knowledge and the development of empowered learner identities has been demonstrated through this project. The use of multimedia has the potential to improve learning by making better connections to learners’ workplaces, homes and community contexts. What was more important than the technology was the ways it was used to engage and support Indigenous learners’ participation in formal education. An approach that focused on the learners’ purpose and perspective also supported the connections between learners and the educational institution. By providing a self-managed system with spaces that were private and open to a community of practice, learners developed a sound awareness of different ways of presenting their information with multimedia forms, including the use of their own contexts to support their learning and outcomes. An ePortfolio approach that combines multimedia approaches supports a strengths-based approach to learning with Indigenous learners and trainers.

There are a number of challenges in building effective systems that provide opportunities for learners to manage and control their ePortfolios with limited expertise in using technology or access to computers and the internet. This is an important challenge in order to engage different cultural and social perspectives while also meeting the need for stability and interoperability. The inclusion of a range of Indigenous trainers and learners at every stage in the design of ePortfolio systems can have benefits for learners and educational systems in the long term.

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ePortfolio and eRecruitment

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Abstract

Many ICT developments, including ePortfolio, replicate paper practice without exploiting the web to provide network effects that increase the value of information the more it is used.

The use of ePortfolio in education is contrasted with the new electronic profiles which eRecruiters have developed. One UK company with a strong presence in Australia, acts as clearing house for 95% of UK recruiters, providing profiles of nearly 3 million individuals. This offers an excellent model with serious flaws that impose unnecessary costs, reduce learners’ control over their data and do not assure data integrity. In education the ideology of personalisation divorced from the practical needs of ordinary people also limits benefits. What interventions may ensure that the eRecruitment market meets the needs of individuals? What is the role of ePortfolio?

Universities’ use of ePortfolio for undergraduate admissions provides a third point of reference.

New data resources such as the MIAP Learner Record funded by the UK Government provide for network effects and are stimulating the development of new services that may transform learners’ experience of learning in education and employment. How may ePortfolio enable individuals to integrate their learning and exploit its value for their personal benefit and that of the economy and therefore of society?

The paper is intended to scope the issues on which future research on eRecruitment should focus. A separate paper scopes the importance of ePortfolio for advice and guidance.
Introduction

The Australian ePortfolio Projectiii suggests that: “Building and maintaining an ePortfolio will help students to be better prepared for the recruitment process, meaning that the quality of employment applications will improve. Students will be able to answer interview questions and selection criteria more effectively by drawing on a wide variety of real life examples. This will make it easier for employers to accurately assess the qualities and suitability of each applicant.”

These capabilities are fundamental to an individual’s personal development but are often not expressed within an ePortfolio in terms that can readily be used for recruitment processes.

The Schwartz review of admissions to UK HE addressed endorsed the University of Nottingham’s proposal to explore the development of “structured personal statements” allowing applicants to map ePortfolio information to entry criteria.iv At the final plenary of the 2009 UCAS38 Admissions Conference this was announced as a priority for implementation.

Working with UCAS the University discussed the full use of ePortfolio with admissions staff, who were initially reluctant to accept the use of ePortfolio presentations because of the additional work required but who concluded that there was a case for their use in a minority of cases for borderline candidates, especially “first in family”.

The Qualifications and Curriculum Framework (QCF)v makes achievement data more useable by recruiters to HE and employment and encompasses Recognition of Prior Learning. ePortfolio will play an enabling role, collating information for assessment or illustrating achievement. ePortfolio’s primary role may be to enable the learner to integrate what s/he is learning in different contexts and to discuss and plan personal development. This will involve reflection but HE has been slower to exploit the potential of web services than eRecruiters such as iProfile.

38 UCAS provides a centralised admissions service to Higher Education Institutions (HEIs) in the UK.
**Literature review**

The paper is based on the initial evaluation of the JISC eAdministration Programme\textsuperscript{vi} in which the services developed were mapped against the HE admission process and MIAP services that add value were identified. Two aspects of the final evaluation currently being undertaken are the implications of the QCF Service Layer for ePortfolio and the EFIFA project, providing feedback to HE applicants.\textsuperscript{vii}

The use of ePortfolio in UK is steadily increasing but patchy. From 2005 all HE courses were expected to provide either an ePortfolio, Progress File or Personal Development Planning Process. A UCISA survey included these processes for the first time in 2008 and found that no UK Higher Education Institution offered this for all courses, 9 reported offering this for between 50% - 99% of courses, 47 for 1% - 49% of courses and 18 offered nothing or did not know.\textsuperscript{viii}

Many learners have many assessment ePortfolios: personal ePortfolios in college and university and either ePortfolios or Human Resource Management (HRM) systems in employment containing personal details about performance, aspirations and personal development. I use the term ePortfolio to denote all systems containing personal data relevant to education and employment over which the individual has rights. The ePortfolio Reference Model funded by JISC\textsuperscript{ix} and a major FP7 project funded by the European Union, TAS3 \textsuperscript{x} have developed the concept of an ePortfolio dashboard that can provide an integrated view of distributed data wherever it is held.

Efficient eRecruitment requires data to be shared between ICT systems in Education and Human Resource Management (HRM), a theme of recent summits on ePortfolio for employability in Maastricht working through issues set out in the HR-Semantics Roadmap *The Semantic challenges and opportunities in the Human Resources domain*. The development of interoperability between systems in education and employment present problems about the rights of the learner to control personal data held by an employer and other third parties. The focus of TAS3 is to give individuals control their personal data wherever this is held.
It is difficult to access useful information about innovative commercial developments. Disclosing information about innovation may reduce a company’s return on investment or identify problems reduces its commercial value. JISC offers proven models for the evaluation of technical innovation which I adapted JISC evaluation techniques to evaluate the commercial systems that could consume education data from the eAdministration programme, in particular eRecruitment.

A major challenge has been to recover data for major government and commercial developments. The HR-XML consortium\textsuperscript{xii} provides a neutral place in which commercial companies and public bodies develop protocols for exchanging the data required for eRecruitment and Talent Management. The schemas of these protocols define generic processes in current use enabling the analysis of eRecruitment and the relationship with protocols in current use in education. An Australian view on commercial developments is provided by ITCRA\textsuperscript{xii}.

**Methodology**

A macro analysis identified key processes with counterparts in different domains and in development. For example HR-XML conventions mapped well to the MIAP CDD conventions used by MIAP. Processes rendered in these formats allow information to be passed from an awarding organisation using MIAP CDD to a recruiter and an employer whose Human Resource Management system makes use of HR-XML. They also disclose similarities and differences between the processes the conventions support.

In 2007 I met with the director of a major Recruitment Clearing House but I do not make use here of the information in the I accessed under a Non Disclosure Agreement. I reviewed systems produced by new companies. I reviewed how standardised HR-XML data were used in employment to improve performance and develop the potential of the individual and then compared these highly innovative approaches exploiting network effects with established solutions whose ambition is limited to improving the process.
Although significant value was added by a new generation of innovative practice, a micro analysis of how these data were consumed for eRecruitment identified significant inefficiencies, especially where authenticated achievement data was not passed from education to employment. I undertook parallel work on the resources and services provided by MIAP-QCF.

The eAdministration programme had a specific interest in ePortfolios in higher education which I supplemented with work on the use of ePortfolio for apprenticeships in UK and Australia. ePortfolios are useful means of collecting evidence for assessment. MIAP-QCF offers sophisticated services that distil this evidence and make it available as credit and for advice and guidance. The formal value of the learning may be less significant than the understanding that the individual develops through the integration of what s/he is learning in different contexts. These findings often appear to reflect the different interests of stakeholder groups, an important area for exploration.

The function of the analysis was not intended to produce definitive answers but to scope the research questions that need to be addressed as these initiatives move forward. For example there are clearly significant cost savings that could be achieved by feeding achievement data from HE through recruitment and into employment, where the data can be used to enhance the personal development of the individual. These findings identify the points where government may wish to consider intervention to improve the operation of the market that is emerging.

Results and Discussion

Background

“ePortfolios might assist a range of business processes including Recruitment and appraisal processes, assisting job applicants to contextualize and understand their development in terms of employability skills and attributes and enhancing the quality of applications...For Training Needs and Career Planning an ePortfolio can assist in the identification of skills gaps and training needs, enabling the provision of targeted employee development plans and therefore
serve as a tool to support staff performance and workforce planning.”

**eRecruitment: The existing Business Case: process improvement**

I&DEA, the Improvement and Development Agency for UK local government, summarises the current standard model of eRecruitment:

“Used correctly e-recruitment can enhance the applicant experience, communicate the employer's image and culture better, make the recruitment process faster, more accountable and standardised, increase the diversity of applicants, provide better management information on applicants, find the right candidate for the job...Automation of a traditional recruitment process will not fully achieve the potential of e-recruitment to improve efficiency and effectiveness. However a complete redesign of recruitment practices may be over ambitious without the expertise of a major outsourcing partner” xiii

I&DEA acknowledge the potential to add further value by linking eRecruitment into wider HR practice: “e-recruitment may be part of a wider programme to make HR more strategic, such as taking a more holistic approach to recruitment or conducting workforce planning.” But the list of efficiency gains from e-recruitment reported by local authorities is distinctly unambitious including: “reduced printing and postage costs, reduced advertising spend from fewer and smaller adverts, less HR staff time spent on basic recruitment tasks.” Some “longer-term cashable benefits” are acknowledged, for example releasing HR staff to carry out higher value activities such as workforce planning.”

Such systems achieve process improvement and cost savings but do not systematically exploit network effects. The new generation of eRecruitment systems offer significant network effects that increase the value of data the more they are used. In economics a **network effect** is where a user of a resource or service increases the value of that product to other people. The classic example is the telephone. The more people own telephones, the more valuable the telephone is to each owner even though the owner did not intend this. This is a fundamental feature of the web xiv. But these present challenges as well as opportunities that may require
intervention. One company in particular has produced an excellent but flawed model that has been commercially successful with nearly 3 million profiles\(^{39}\) in UK, is contracted to 95% of UK recruitment agencies and is now developing a significant presence in Australia. Several smaller developers are following the same pattern.\(^{40}\)

However the current business models for this approach have significant flaws that impose unnecessary costs and limit individuals’ control of their personal data. If education provided quality assured personal data for quality assured eRecruitment services to consume it may become possible to develop a very efficient model that benefits individuals, employers and educators through the exploitation of the rich sources of achievement data that are becoming available.

**Recruitment to Employment exploiting network effects**

Innovative UK eRecruitment practice exploits network effects and individuals may feel in control all this takes place in an essentially closed system and other aspects of the generic model are suspect:

Typically these innovative eRecruitment systems are closed, with data entered on web forms or scraped from paper documents and other sources. I expect that this results in poor quality data as the context is often likely to be lost, making accurate evaluation of data difficult. It is important that the *integrity of the data is assured.* Comments on user forums suggest that this is a live issue.

Currently data must be authenticated: typical charges to meet the requirements of blue chip companies are of the order of £125-150 but increasingly this service is free to the applicant. The applicant is not the customer but the resource the company exploits to develop income streams from recruiters and employers.\(^{xv}\) It is likely that most universities authenticating these

\(^{39}\) [http://www.itwire.com/content/view/23333/1231/](http://www.itwire.com/content/view/23333/1231/)

\(^{40}\) For an Australian view of the system in Asia Pacific see [http://www.itwire.com/content/view/19882/50/](http://www.itwire.com/content/view/19882/50/).
data do so below full economic cost. A feed of authenticated data from HE at full economic cost would improve the integrity of the data covering HEIs full costs and also reduce the recruiter’s costs.

The eRecruiter may retain rights over the profile of an individual for life. Comments on user forums suggest that this is a live issue: individuals may delete their profiles with a company, but if they subsequently sign up with another recruiter contracted to the recruitment clearing house the agreement between the recruiter and the clearing house may require their profiles to be copied to the clearing house. Under these terms a recruiting house could acquire nearly perfect knowledge of its market, a feature of many current successful internet models. In this situation the individual cannot be said to have meaningful control over their personal data.

Suspect data, such as degree class are used by eRecruiters but where rich personal data are also available these are said to be used as indicators rather than discriminators since the evidence collected by the recruiter shows rich processable personal data to be a better discriminator.

In some systems the individual can develop a rich personal profile to contextualise the quantified data the profile contains, essentially creating an ePortfolio which the individual updates but over which the subject of the ePortfolio has strictly limited rights.

Why is that this flawed approach has been so successful?

Simple feedback to the individual on how s/he is rated by different employers for different roles is valuable: the applicant gets a feel for likely opportunities. By aggregating the outcomes of thousands of applications and identifying common patterns the Recruiter can exploit network effects to propose likely prospects to applicants and advise applicants on how to optimise their chances. The recruiter can evidence the success of the process to both applicants and employers. If the applicant is primarily concerned with getting a good job the significant flaws in the process may be ignored, for example the limited control learners are able to exercise over their personal data.
Benefits to Large Employers

Where the eRecruiter uses normalised data such as HR-XML the recruitment company and the end employer information can be passed directly into a company’s HR solution, reducing costs to the recruiter costs and the employer’s as well as providing rich data for talent management to develop the individual’s potential in employment. So, as well as burning money to capture data whose quality is not proven, the eRecruiter then normalises applicant data and pays for the establishment of what is effectively a new national infrastructure that will significantly reduce costs for large employers: the quantum world of capitalism.

Small Employers

Small employers do not have the capacity to make effective use of these possibilities making it difficult for them to compete and grow. If Government has a responsibility to moderate the perverse behaviour of markets there is a clear case for intervention to reform the supply of data from education and assure their integrity. Government benefits from Recruiters’ investment in promoting normalised data which larger companies have the resources to exploit but Government would need to intervene to enable small businesses to compete, perhaps by providing shared HR services through regional development agencies.

Potential benefits of network effects

These initiatives move beyond organisation-centred data management systems. A Learner Record for Higher Education, offering similar functionality to the MIAP Learner Record for HE achievement could provide a very powerful resource which quality assured versions eRecruitment services could use to transform Advice and Guidance and increase employers ability to make effective use of achievement data in particular to equip employees with the skills and capabilities a successful company will require.
Basic Value Added to the individual

The MIAP Learner Record provides Rules of combination that allow records of achievement to be combined to form or contribute toward higher level qualifications enabling a learner, often with an advisor, to model of how s/he could build on current achievement to gain higher qualifications. Some scenarios:

Basic Value Added to the employer: assessment of potential

A small employer is given access to the same data for two candidates. Using a quality assured web service could take account of an individual’s rate of improvement. For example, one candidate has higher achievement than another overall but a web service also graphs the rate of progress and this is flat whereas the other candidate’s is increasing exponentially. The second candidate is preferred. The same approach could be applied to HE admissions.\textsuperscript{xvi}

Further Value Added to the employer: competences

A shared service could also add take specific account of the competences required for a work role and present the relative distance to the achievement of the further competences the employer expects to require in future. The employer is assessing the potential of the candidate.

Further Value Added to the Applicant and the Employer: Network effects

Where the employer provides feedback to the applicant on why s/he did not get the post the applicant can takes this into account in identifying where to apply next and in preparing an application. Where the employer provides anonymised feedback about all successful and unsuccessful candidates: a web service could allow an individual to assess their profile against
these data, learning not just from feedback on their own experience but all feedback on the experience of all applicants.

This effect could be amplified if an employer looks ahead to identify the skills s/he expects s/he will require and publishes these expected needs on the web for potential applicants and learning providers in the region to take account of. If more employers follow suite a rich continually updated forecast of demand for skills and qualifications could becomes a key resource for individuals and providers and has the potential to transform the skills profile of a region through the transformation of the prospects of many individuals by enabling them to match their personal development to the needs of employers.

**Conclusion**

Personal collections of information constructed within an ePortfolio are important resources but their value is increased exponentially where information is shared and re-mixed. But how may individuals exploit network effects? Individuals need Personal Guidance web services to apply what they have learned in novel contexts further enriching their understanding.

The technology is not just a tool to meet the requirements set by educators or employers but offers novel opportunities that can be harnessed to enhance education, employment and society. We need to understand the nature and potential of these opportunities to begin to exploit the value of the web. The fundamental nature of this phenomenon is not the collection of data within an ePortfolio but the value added by sharing data and collaboration between people that an ePortfolio dashboard will enable. In this way the networks we develop increase the social capital available to all people and therefore the human capital of many individuals.

**Summary, Conclusions and Implications**

Although there is consensus on its potential, ePortfolio currently plays a subsidiary role
for recruitment. Previous advice on eRecruitment to UK HE has not understood the significance of technical developments especially network effects.

Is ePortfolio locked into an educational silo? A leading practitioner, Dr. Helen Barrett, committed herself to: “exploring and changing the predominant [ePortfolio] paradigm: “from an institutional focus to a more family and/or individual focus; from a metaphor of “portfolio as test of skills to portfolio as story of deep learning.” xvii This beautiful idea, like Benkler’s thesis on peer to peer production41 assumes the existence of a benign economy in which access to education and good employment gives every citizen the opportunity for learning and social mobility. Even at the height of the noughties boom this was never the case: ePortfolio should be seen in the context of society.

There is a strong case:

- For government to intervene to ensure commercial eRecruiters meet the needs of individuals and employers and in this way contribute to the prosperity on which a more equal society can be built.
- For higher education to move from supply led initiatives providing data to employers without an adequate understanding of their ICT systems toward an engagement with ICT developments in human resource systems in order to provide the quality assured data eRecruiters need in order to provide employers with the information they require to develop the talent of their people through learning in employment.

Successful ePortfolio initiatives in the UK are often associated with professional bodies. How may ePortfolio provide the networks, communities and confidence that professional staff benefit from to other workers and people seeking employment?

A key issue for research is how ePortfolio could add more value. There is a broad consensus in both education and employment that ePortfolio has the potential to play a leading

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41 In the Wealth of Networks Yokai Benkler notes the low cost of exploiting the internet as compared to the industrial economy and ably discusses the social implications without taking full account of the economic implications, for example of people on lower incomes. See: http://www.benkler.org/Benkler_Wealth_Of_Networks.pdf.
Government policies to establish a new Learner Record, and a new Curriculum and Qualification Framework whose service layer could significantly benefit from ePortfolio. This requires education practice to actively engage ICT developments in other sectors. While Barrett is right to emphasise the primary importance of deep learning, practical benefits are often the primary reason for motivating people to engage with learning. Becta’s work on ePortfolio for vocational pathways such as apprenticeships pioneer the integrated use of ePortfolio for education to which JISC eAdministration projects could add value.

Current eRecruitment practice (page 6) provides a contrast with innovative eRecruitment exploiting network effects (from page 7). A straightforward intervention could open the way to effective collaboration between sectors: the provision of the quality assured electronic HE achievement data that eRecruiters and employers require for use by quality assured services. This would reduce costs and stimulate the development of services. Perhaps the most fundamental need for HE ePortfolio is the development of services to provide network effects adding the kind of value evident in eRecruitment.

The overview of stakeholders is intended to stimulate the development of a more formal model to support an analysis of the demand for information, in particular from employers, with some illustrations of the network effects that this would enable. The business cases for interventions should be defined.

In education learners may carefully construct their understanding of a subject and its application to a problem: the focus is on deep learning. In employment people are often required to acquire new skills and knowledge at short notice and apply what they know in new, unfamiliar contexts. Existing knowledge must be swiftly re-factored and opportunities for acquiring and leveraging other people’s expertise identified and exploited. This lies near the heart of the difference between education and employability.
End Notes

i MIAP, the managing Information Across Partners Programme funded by the UK Government provides a fine grained Learner Record for pre-HE achievement data and services to make use of it for personal planning, advice and guidance and admissions to employment and HE. For information about how this may integrate with HE level achievement data see http://wiki.cetis.ac.uk/HEAR_MIAP_Learner_Record_mapping.

ii This will reflect the draft of the final evaluation of parts of the JISC administration I will complete in May 2009.

iii Australian ePortfolio Newsletter Newsletter of February 2009.


v For an overview of QCF with links to other resources see: http://qca.org.uk/libraryAssets/media/Claiming_credit_7th_proof_web_ready.pdf.

vi The author provided the basis for the Initial Evaluation of eAdmin Projects supporting Admission to HE and Lifelong Learning, JLT(08)23f Annex F, eAdmin. The basis for a final evaluation will be submitted on May 31 2009.

vii This project will be included in the final evaluation of the JISC eAdministration programme.


ix ePortfolio Reference Model funded by JISC for a service usage model see: http://www.elframework.org/refmodels/epll/ with further resources available from: http://www.nottingham.ac.uk/epreferencemodel/.

x TAS3 a major FP7 Integrated Project funded by the European Commissioned will provide a dynamically generated view of distributed data under the individual’s control, see: http://www.tas3.eu/.

xi HR-XML see: www.hr-xml.org

xii For a view of the use of the UK iProfile in Australia from ITCRA see: http://www.itwire.com/content/view/19882/50/.
CIPD offer more generic advice, and a formal certificate in eRecruitment and selection: [http://www.cipd.co.uk/subjects/recruitmen/onlnrecruit/onlrec.htm](http://www.cipd.co.uk/subjects/recruitmen/onlnrecruit/onlrec.htm).


Figures reported to the MIAP Higher Education Advisory Group by John Slater of HERO and Peter Rees Jones of JISC.

EFIFA The JISC EFIFA project led by UCAS is developing similar feedback mechanisms to HE applicants and schools which may offer a model of good practice for eRecruiters. The final report will be posted by JISC in 2009.