



Connecting learning to the future

Book of Papers

28–29 September 2016

2016 ePortfolio Forum: Connecting learning to the future

Published by eLearning Services
Queensland University of Technology
2 George Street,
Brisbane QLD 4000

September 2016

The 2016 ePortfolio Forum Planning Committee confirms that short papers accepted for this publication:

- Meet the definition of research in relation to creativity, originality, and increasing humanity's stock of knowledge;
- Are selected on the basis of a peer review process that is independent, qualified expert review; double-blind reviews conducted on the short papers, prior to publication;
- Are published and presented at a conference having national and international significance as evidenced by registrations and participation; and
- Will be made available widely through the Conference web site.

eBook licensed under Creative Commons – BY – NC
Individual papers are © to individual authors

Contents

	page
Contemporary practice, the challenge to evidence them <i>John McNerney</i>	1
Investigating student's use of portable computing devices in a Music performance unit <i>Eleanor McPhee</i>	10
Ready? Action! Building a portfolio of evidence in teacher education <i>Jennifer Masters</i>	17
Digital scholarship powered by reflection and reflective practice through the use of an ePortfolio approach to course design in Higher Education <i>Judy O'Connell</i>	25
Portfolios for success: Guiding students' ability to understand and articulate their skills and achievements <i>Heather Pate</i>	35
Developing professional identity through self-reflection using an ePortfolio app <i>Ruth Sibson and Linda Riebe</i>	43
Evaluating the use of a career ePortfolio in the development of business students' professional identities <i>Ruth Sibson and Dean Roepen</i>	53
ePortfolios through the Looking Glass: Projecting our Learning into the Future <i>Dr Christine Slade and Associate Professor Gillian Hallam</i>	61
ePortfolio improves 'scientist-based' integrative professional and career development learning in a 3rd year undergraduate Cancer Sciences course <i>Jia-Lin Yang</i>	68
A Portfolio approach to clinical competency assessment in Oral Health/Dentistry <i>Terry Young, Ron Knevel and Sarah Down</i>	80

* * * * *

Contemporary practice, the challenge to evidence them

How Monash radiography is aiming to help students prepare for life after University using PebblePad™

John McInerney
Monash University

Abstract

In keeping with an explosion in the use of technology in education, PebblePad™ was introduced into the Bachelor of Radiography and Medical Imaging (Hons) (BRadMedImg) program at Monash University in 2014. PebblePad™ was introduced as an innovative clinical learning platform to replace the existing paper-based approach. The year level paper based clinical workbooks used contract learning as a vehicle to facilitate the development of radiographic technical and procedural skills and radiographic professional skills. Despite the best of intentions these workbooks were seldom seen by clinicians and students as testament to the whole journey from student to registered radiographer.

With the inception of the Medical Radiation Practice Board of Australia (MRPBA) in 2012 and the subsequent publication of the MRPBA professional capabilities framework, it became imperative to establish a more integrated and permanent system of monitoring and evidencing student clinical progression. Ensuring the regulator that students could understand and evidence the registration requirements became difficult with paper based workbooks due to their static nature.

The use of PebblePad™ has been re imagined to allow academic and clinical staff to assist students to prepare for life after Monash in a more comprehensive manner than was previously the case. This includes the preparation of evidence for accreditation, maintaining a professional ePortfolio and also job applications and interview confidence.

Students of the BRadMedImg course now record their ongoing professional development and collate evidence in preparation for graduation and registration in the form of a rich ePortfolio using multimedia such as images and blogs. Strong guidance is provided throughout the development of the ePortfolio to heighten students' awareness of the expectations of the registration authority and employers alike.

PebblePad™ is at the heart of our clinical programme with students and clinical partners now understanding that it is much more than simply a repository for clinical documentation.

Keywords: *Technology, AHPRA, Registration, Work readiness, ePortfolio*

Introduction

Since 1 July 2012 medical radiation practitioners have been a nationally regulated health profession (MRPBA, 2013). The Bachelor of Radiography and Medical Imaging (Hons) (BRadMedImg) program at Monash University is an integrated academic and clinical 4-year degree level program. It prepares students to become registered practitioners under the auspices of Medical Radiation Practice Board of Australia (MRPBA). The BRadMedImg has always purported an overt commitment to developing critically reflective radiographers with the multifaceted skill base to match (Baird, 2008).

PebblePad™ was introduced into the Bachelor of Radiography and Medical Imaging (Hons) (BRadMedImg) program at Monash University in 2014. PebblePad™ was introduced as an innovative clinical learning platform to replace the existing paper-based approach. Previously students used paper-based workbooks that contained information and space for almost everything they needed to read and complete for their clinical placements. Despite the best of intentions these workbooks were seldom seen by clinicians and students as a testament to the journey from student to registered radiographer. The use of PebblePad™ has been re imagined to allow academic and clinical staff to assist students to prepare for life after Monash and for a life under the auspices of the MRPBA in a more comprehensive manner than was previously the case.

Aim

This paper aims to demonstrate how the Monash University radiography programme uses PebblePad™ technology to provide students with a cohesive and integrated learning experience, one which they can continue to build on after graduation. It will focus on ePortfolios and how we at Monash support and guide students through the process of compiling an ePortfolio in preparation for life after University. It will explore the use of the ePortfolio for evidencing registration requirements and enhancing workplace readiness.

Literature review

Technology has become an increasing part of evidencing learning and professional development and Universities are expected to embed them as part of their teaching and learning (John-Matthews, Gibbs, & Messer, 2013; Kowalczyk, 2014;). Indeed Kregor, Breslin, and Fountain (2012) go so far as to say that Universities are in fact obliged to implement e-Learning strategies if they are to remain competitive in the tertiary education marketplace.

Monash's own Better Teaching Better Learning agenda has stated that there is an "explosion" of new technology which must be harnessed appropriately to provide diverse opportunities for students to build and articulate appropriate attributes, skills and knowledge, providing them with the best prospects for their next career step (Monash University, 2015).

One of the technologies gathering force across the health care professions is the use of electronic portfolios (ePortfolio) (Jasper, 2005; Woodley & Sims, 2011; Housego & Parker, 2009).

An ePortfolio is a collection of authentic evidence of student learning and achievement and it can be useful in enhancing postgraduate employment prospects (Wheat & Currie, 2007). Portfolios provide potential employers of graduates with an enhanced means of make better recruitment decisions. The ePortfolios can effectively align student goals and capabilities with departmental needs and opportunities. Across the health care professions ePortfolios have been gathering credence as useful tools in the assessment of practice competencies and their theoretical underpinnings (Woodley & Sims, 2011; Housego & Parker, 2009). They have also been shown to develop generic or specific skills such as critical thinking, reflective practice (Jasper, 2005; Woodley & Sims, 2011; Housego & Parker, 2009).

ePortfolios can provide students with a dynamic, cohesive and integrated learning experience. With an ePortfolio students can be more flexible in preparing for their professional life. They can continue to access them after graduation. The value of personal and professional portfolios has been well documented. Portfolios are being used for a variety of theoretical and clinical reasons including using them to assess clinical competence; to reduce the theory practice gap; monitor student learning over a period of time; and for personal and professional development(Nairn et al., 2006). Portfolios may be used to evidence different learning goals, and are especially useful where higher levels of learning are expected, such as critical thinking (Davison, Kudlas, & Mannelin, 2003). It is also documented that the process of constructing a portfolio increases reflective abilities (Klenowski, 2002; Jasper, 2005). ePortfolios help students become reflective learners who are conscious of their personal and professional strengths and weaknesses, as well as to make their existing and developing skills more explicit (Australian ePortfolio Project, 2008).

Within the field of radiography ePortfolios can be effectively used as formative tools. Wheat and Currie (2007) suggest that the implementation of a portfolio in medical radiation sciences would benefit workplaces by delivering “self-motivated, self-reflective, professional and competent practitioners” with a deep understanding of the application of theory to practice.

They suggest that as a summative tool, the student portfolio provides authentic evidence of graduate qualities and attributes and provide students a platform to showcase their skills to potential employers.

Background to the study

Upon graduation students become registered practitioners with the MRPBA. The regulatory functions of the MRPBA are supported by Australian Health Practitioner Regulation Agency (AHPRA) (MRPBA, 2013). At this stage of fledgling practitioners, evidence of a successful course completion is required by AHPRA, Figure 1, highlighted in red.

To continue to practice in Australia, practitioners must maintain registration with the MRPBA and meet the Board’s registration standards by declaring that they have met the registration standards for your profession. To do this they must be able to

evidence their own commitment to professional development. Figure 1, highlighted in black.

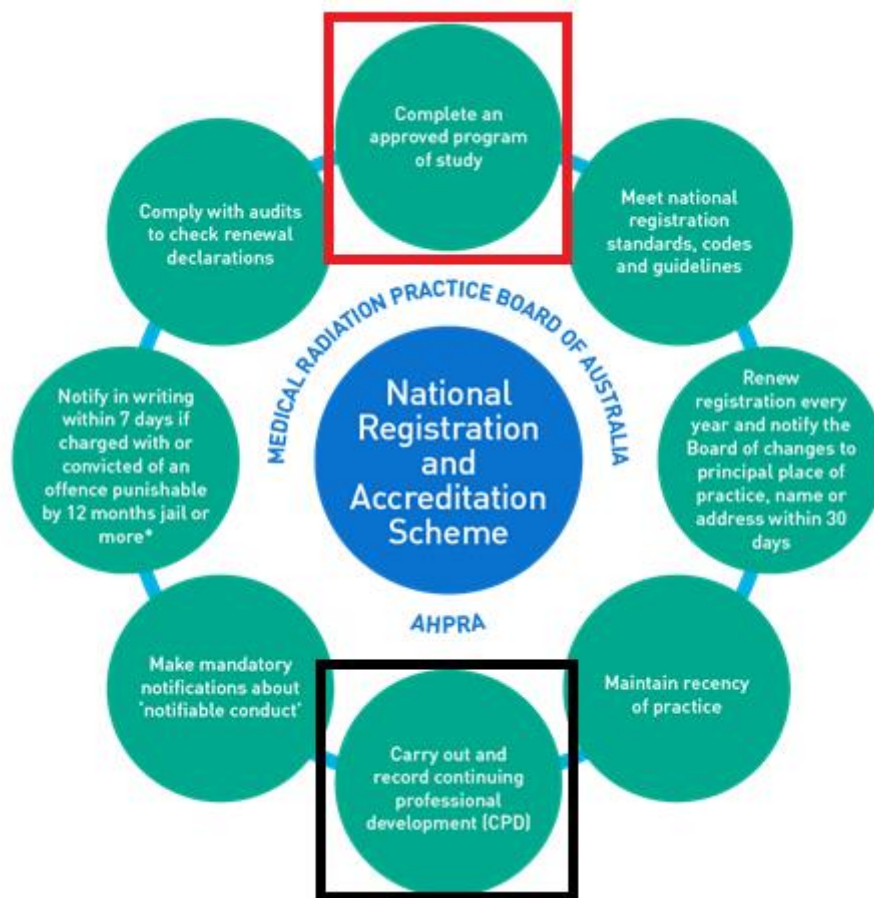


Figure 1: MRPBA, National registration and accreditation scheme, continuing registration.

With the inception of the Medical Radiation Practice Board of Australia (MRPBA) in 2012, and the subsequent publication of the MRPBA professional capabilities framework Radiographers as well as other health professionals are obliged to embrace a more contemporary and integrated conceptualisation of competence (Mc Inerney & Baird, 2016). In 2013 the MRPBA released its Capability Framework which sought to identify the minimum knowledge, skills and professional attributes necessary for entry level practice. This constituted a shift away from describing these through the oculus of a competency based framework. A capability is future looking, adaptive and dynamic (MRPBA, 2013). The definitions by the MRPBA encapsulate this:

- **“Capability** is the extent to which an individual can apply, adapt and synthesise new knowledge from experience and so continue to improve their performance, and
- **Competence** is what individuals know or are able to do in terms of knowledge, skills and attitudes.”

This change acknowledges the new dynamic in health care requiring practitioners to utilize more complex models of practice to shape their knowledge and actively use it to enhance professional judgement. With this national registration and a common code of conduct it is no longer an option and Radiographers are now obliged to embrace these complex conceptualisations of competence, including the capacity to

apply critical and reflective thinking to resolve clinical challenges (MRPBA, 2013; Radiography, 2009; Sim & Radloff, 2009; Yelder & Davis, 2009). The MRPBA has further stated that in order for practitioners to demonstrate a capability rather than a competency, and thus achieve registration status, the candidate must be able to display their skill in a holistic fashion.

While it has long been recognized in medical radiation sciences that there is demand for a tool that provides authentic evidence of the capabilities, skill and knowledge base of graduates, with particular regard for the requirements for professional accreditation (Wheat & Currie, 2007) the increased complexity of MRPBA capabilities framework, evidencing and ensuring understanding of the capabilities is now even more difficult. Ensuring the regulator that students could understand and evidence the registration requirements became difficult with paper based workbooks due to their static nature. It has therefore become imperative that a more integrated and permanent system of monitoring and evidencing student clinical progression over time be established that could provide an agility in being able to respond to the changing registration and workplace environments.

This change requires new means of engagement which require students, and practitioners, to consciously consider the MRPBA capabilities framework. They need to be aware of what they will need to evidence them if audited, and how they will do this in a cohesive fashion.

Methods/Discussion

With the ever increasing presence of technology in education and beyond (John-Matthews, Gibbs, & Messer, 2013; Kowalczyk, 2014; Monash University, 2015) the BRadMedImg department realised that advanced learning technologies could address the contemporary needs of students, employers and registration authorities. It became obvious that a move to an online environment could overcome restrictions associated with the traditional approach and engender more effective understanding of registration requirements. Where workbooks failed to foster a “capstone” effort of capturing progression, students are now capturing their skill development across placements rather than within placements, moving from an insular mindset to a more holistic approach.

PebblePad™ was introduced into the program at Monash University in 2014. It was chosen as it offers a number of different tools to allow students to plan their work, organise evidence of their learning and record and reflect on their study (PebblePad, n.d.). Initially the implementation of PebblePad™ focused purely on evidencing clinical competencies using workbooks and feedback templates. However, the realisation was soon apparent that PebblePad™ could be much more than a repository for clinical documentation. PebblePad™ has afforded a variety of uses, most especially ePortfolio development.

Students of the BRadMedImg(Hons) course record their ongoing professional development and collate evidence in preparation for graduation and registration in the form of a rich ePortfolio using multimedia such as images and blogs. Using the reflective structure of PebblePad™ students can develop a strong reflective stance on their learning and professional capabilities while evidencing and showcasing their

learning and professional achievements through a curated repository. The portfolio will be a collective works spanning the duration of a student's studies. This ePortfolio will form part of their final year Clinical Portfolio submission. Students will present their completed ePortfolios at a seminar called "Why should I be registered". In this forum they will need to impress upon both academic and clinical staff what it is they understand.

As with the introduction of any new technology it is crucial that students should be advised, guided and instructed through the portfolio development process (Chow, Herold, Choo, & Chan, 2012). With a good support and guidance in place for students this offers an opportunity for students to build and articulate appropriate attributes, skills and knowledge, providing them with the best prospects for their next career step, both registration and workforce related.

Students are introduced to the concept of a personal professional ePortfolio at semester two year one. They are provided with guidance throughout the process with regular tutorial sessions in year 2 and 3, support and input from clinical teaching staff happens across clinical placements (See Figure 2 for outline support framework). The framework for the ePortfolio is based on the professional capabilities articulated by the MRPBA (MRPBA, 2013). Thus the development of their ePortfolio makes students aware of, and understand the expectations for registration as a professional. Students are expected to provide evidence in their ePortfolio to address each registration "domain", heightening their awareness of what acceptable CPD might be.

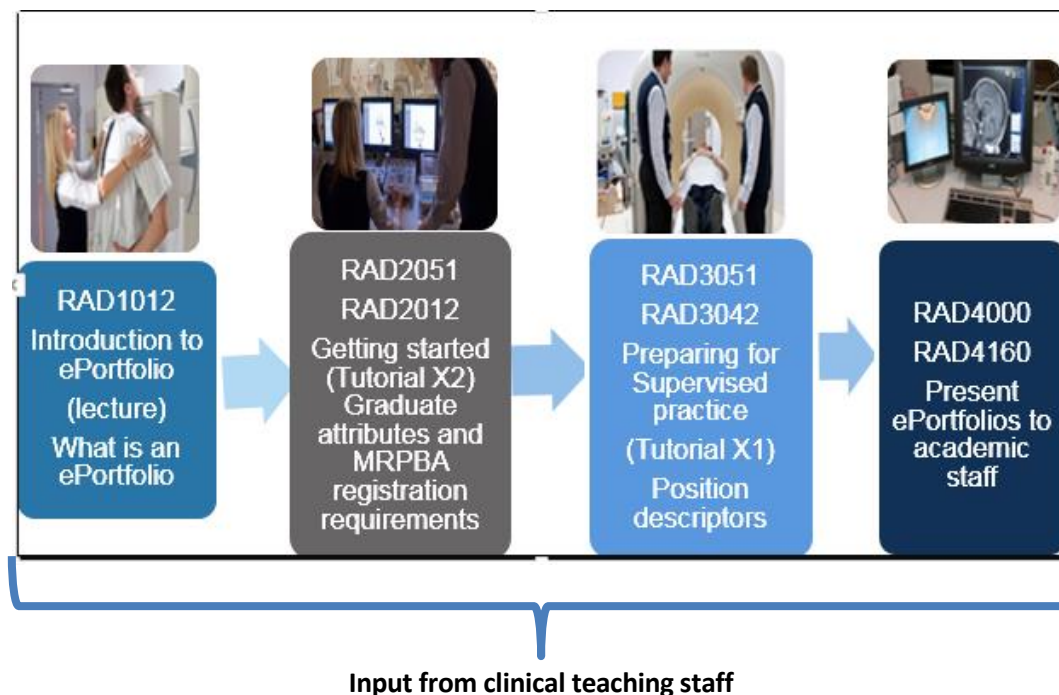


Figure 2: Support framework for ePortfolio development.

Students can now more confidently understand what it means to be registered as they are required to actively evidence each one of the registration requirements.

In year four they will use their ePortfolio to answer the question “Why should I be registered?” therefore engaging students in their own learning journey all the way through to course completion and beyond.

The students start writing “Bios” in semester 2, year 1 with some basic information about themselves. To support students and give them confidence for job interviews they are introduced to graduate position descriptions in year 3 closer to application for a supervised practice position and onwards to job searches towards the end of year 4. Students interrogate these descriptors, mining them for the key skills required in the workplace. They outline their own commensurate skill mix to address these key selection criteria within their Bio, giving students interview confidence. In essence these Bios naturally evolve into cover letters that students develop over three years.

While the ePortfolios are based on core curricular activities, the nature of the technology and ePortfolios themselves means students can look beyond these to extra-curricular activities which are equally valuable in development of a student’s work ready skills. This has been a key tenet of the ePortfolio movement at Monash.

Conclusion

PebblePad™ and ePortfolios are at the heart of our clinical programme with students and clinical partners now understanding that PebblePad™ is much more than simply a repository for clinical documentation. Appropriate use of technology has provided students with diverse opportunities to build and articulate appropriate attributes, skills and knowledge, providing them with the best prospects for their next career step.

Students are furthering the clinical portfolios to create ePortfolios in preparation for registration and entry to the workforce, ensuring that they can respond to the changing workforce landscape and its associated disruptions with agility.

The BRadMedImg is a leader in embracing the advances in technologies available to enable students to articulate their skills with confidence to registration authority and potential employers. Monash University is the first undergraduate radiography course in Australia to implement a wholly online clinical studies repository for all aspects of clinical placements from student led activities, clinical skills assessments and clinical liaison.

References

- Australian Institute of Radiography. (2009). *Review of the professional development year. A discussion paper*. National Professional Development Programme.
- Baird, M. A. (2008). Towards the development of a reflective radiographer: Challenges and constraints. *Biomedical Imaging and Intervention Journal*, 4(1), e9. doi:10.2349/bij.4.1.e9

- Chow, M., Herold, D. K., Choo, T-M., & Chan, K. (2012). Extending the technology acceptance model to explore the intention to use second life for enhancing healthcare education. *Computers & Education*, (4), 1136–1144. doi:10.1016/j.compedu.2012.05.011
- Davison, H. C., Kudlas, M. J., & Mannelin, L. R. (2003). Portfolios and critical thinking (teaching techniques). *Radiologic Technology*, 74, 509.
- Housego, S., & Parker, N. (2009). *Positioning ePortfolios in an integrated curriculum. Education & Training*, 51(5/6), 408–421.
- Jasper, M. A., & Fulton, J. (2005, July). Marking criteria for assessing practice-based portfolios at masters' level. *Nurse Education Today*, 25(5), 377–389. Retrieved from <http://dx.doi.org/10.1016/j.nedt.2005.03.006>
- John-Matthews, J. S., Gibbs, V., & Messer, S. (2013). Extending the role of technology enhanced learning within an undergraduate radiography programme. *Radiography*, 19(1), 67–72. doi:http://dx.doi.org/10.1016/j.radi.2012.10.003
- Klenowski, V. (2002). *Developing portfolios for learning and assessment: Processes and principles*. London: RoutledgeFalmer.
- Kowalczyk, N. K. (2014). Perceived barriers to online education by radiologic science educators. *Radiologic Technology*, 85(5), 486–493.
- Kregor, G., Breslin, M., & Fountain, W. (2012). Experience and beliefs of technology users at an Australian university: Keys to maximising e-learning potential. *Australasian Journal of Educational Technology*, 28(8), 1382–1404.
- McInerney, J., & Baird, M. (2016). Developing critical practitioners: A review of teaching methods in the Bachelor of Radiography and Medical Imaging. *Radiography*, 22(1), e40–e53. doi:http://dx.doi.org/10.1016/j.radi.2015.07.001
- Medical Radiation Practice Board of Australia. (2013). *Professional capabilities for medical radiation practice*. Retrieved from <http://www.medicalradiationpracticeboard.gov.au/>
- Monash University. (2015). *The better teaching, better learning program*. Melbourne, Vic.: Office of the Vice-Provost (Teaching and learning), Monash University.
- Nairn, S., O'Brien, E., Traynor, V., Williams, G., Chapple, M., & Johnson, S. (2006). Student nurses' knowledge, skills and attitudes towards the use of portfolios in a school of nursing. *Journal of Clinical Nursing*, 15(12), 1509–1520. doi:10.1111/j.1365-2702.2005.01432.x
- PebblePad. (n.d.). Retrieved from <http://www.pebblepad.com.au/l/personal.aspx>
- Sim, J., & Radloff, A. (2009). Profession and professionalisation in medical radiation science as an emergent profession. *Radiography*, 15(3), 203–208. doi:http://dx.doi.org/10.1016/j.radi.2008.05.001
- Wheat, J. M., & Currie, G. M. (2007). A potential role for student portfolios in the medical radiation sciences. *Radiographer: The Official Journal of the Australian Institute of Radiography*, 54(1), 11–13.

- Woodley, C., & Sims, R. (2011). *EPortfolios, professional development and employability: Some student perceptions. Campus-wide Information Systems*, 28(3), 164–174.
- Yielder, J., & Davis, M. (2009). Where radiographers fear to tread: Resistance and apathy in radiography practice. *Radiography*, 15(4), 345–350. doi:<http://dx.doi.org/10.1016/j.radi.2009.07.002>

Biography

John McNerney

John McNerney is a lecturer in the Bachelor of Radiography and Medical Imaging course at Monash University in Melbourne. He is an early career researcher. He has a particular interest in the student perceptions of education. He is also interested in learning activities to facilitate the development of critical thinking skills and professionalism.

Investigating student's use of portable computing devices in a Music performance unit

Eleanor McPhee

University of Wollongong

This paper presents the findings of a study delving into the use of tablets, smart phones and laptops in creating ePortfolios for a 2nd year Bachelor of Music performance unit. This project investigates the devices used to video student rehearsals or performances, the ways that the devices were used, and the reasons that students selected their device of choice. Of the devices used, the iPad was chosen by a majority of students (29 out of 40 participants) because it was easy to use although some students found its storage limiting. Students also used their laptops, often to sync data from iPad to laptop which made the use of apps that worked across multiple platforms essential. iPhones, android phones and iPods were also used. The ways the students used these devices was much broader than anticipated and fell into five categories: notetaking and organization, social media and sharing, research and practice, recording and editing and music creation. Results indicated that, rather than only recording their performance at the end of semester, the devices were a pivotal part of the rehearsal process from the beginning and influenced the ways in which students created a performance.

Introduction

The ways that people interact with new technologies continue to create new learning possibilities and challenges for pedagogy (Rossing, Miller, Cecil, & Stamper, 2012; Stowell & Dixon, 2014). Digital devices and the internet have facilitated changes in the ways that we create and interact with music (Wallerstedt & Hillman, 2015) and this creating and interacting is less about the devices themselves, rather, these devices allow learning to be more situated, personal, collaborative and lifelong (Naismith, Lonsdale, Vavoula, & Sharples, 2004; Rossing et al., 2012). The digitalization of music has brought new musical instruments, genres and professions, and also changed the way we think about creativity (Burnard, 2012). In fact, research suggests that “the emergence of the iPad in the music technology landscape will democratize music making further in the same way that the emergence of digital cameras made photography and filmmaking available to anyone” (Tough, 2009, p. 4).

This paper delves into students' use of portable computing devices such as tablets, smart phones and laptops in the creation of ePortfolios for a 2nd year bachelor of music performance unit. This research asked students to complete a questionnaire at the end of the unit which asked them to describe the devices that they used, and their reasons for choosing their device, as well as the ways the students used their device and the software and/or applications used.

This paper asks the following questions:

- What mobile computing devices did the students use to complete the ePortfolio task?
- Why were these devices chosen?
- How were these devices used?
- In what ways did the devices influence the rehearsal process?

Literature — IT in music learning

The use of portable computing devices in education is a growing area of interest. A recent conclusion drawn by research into portable computer use in elementary schools in Sweden is that by far the most used piece of technology that students use in connection with music is the mobile phone (Erixon et al., 2012, p. 11). Wallerstedt and Hillman (2015) analysed the IT use of year 9 students performing in pop groups. They found that students primarily used mobile phones and phone use involved listening to recordings of songs to be performed, downloading notations and watching tutorials that illustrated how to play sections of songs. This use of mobile computing devices has changed the ways that students learn because it allows students to learn outside the classroom via resources such as YouTube (Harwood & Marsch, 2012). This also sees the gap between formal and informal learning shrink with the incorporation of student's preferred music in formal music lessons (Stowell & Dixon, 2014). This contributes to a sense of creative play because students can share video clips with others throughout the world and they can use applications to create, manipulate and share their own music (Wallerstedt & Hillman, 2015; Wallerstedt & Pramling, 2015). Further to this, it is posited that the notion of "embeddedness" (Puentedura, 2011) where the device "becomes a part of the student's daily cerebral processes as a tool to resolve problems, socialise with the world, and perform common productivity tasks" (Order, 2015). The research also describes portable computing devices as being "curiosity amplifiers" (Brown, 2010). Goodwin (2012) concurs with teachers in this study finding that iPads provided students with "creative and individualized opportunities to express their understanding (p. 8).

Method

This study takes a naturalistic approach because it didn't prescribe the kinds of devices or applications that students used. Rather, it asked students to describe their mobile computing use when undertaking an ePortfolio task as part of a second year Bachelor of Music performance unit. It should be noted that, although students were free to use any mobile computing device that they wished, the university gives all enrolled first year students an Apple iPad therefore iPad use is high. Students were asked to fill out an anonymous short answer questionnaire of 4 questions which are included in Table 1 and 40 students returned the questionnaire. Data was analysed using the mixed methods browser-based data analysis tool Dedoose (2014).

Table 1: Questionnaire.

1.	Describe the device or devices that you use to video rehearsal/performance in a designated assessment task
2.	Describe the program or programs that you use for editing the video footage before insertion in the essay
3.	Why did you choose this device over other videoing devices?
4.	How do you use your iPad in other units of the music program?

Findings

Given that every student owned an iPad, it is unsurprising that this was the most commonly used device. The devices used are included in Table 2. Where students used more than one device in combination, most commonly iPad with Mac, they chose to video the raw footage on the iPad and edit it during the rehearsal process using the Mac. Editing directly during the rehearsal allowed students to limit the amount of storage taken up in the hand held computing device. It also allowed students to share the footage directly via YouTube. Editing was minimal and involved cutting out unwanted footage and rotating images where necessary.

Windows live movie maker flipped images when screen rotated. Not much else in editing otherwise.

(Participant 3)

Disadvantages of the hand held mobile devices were found to be a lack of storage whereas those students who chose to use laptops to create video found them to be cumbersome and awkward to use.

I used my iPhone, I always took my iPad but used my iPhone as it had more space to film.

(Participant 13)

Table 2: Devices used.

iPad	30
iPhone	13
Mac	7
Phone unspecified	4
iPad Mini	2
Android phone	2
iPod	1
Laptop unspecified	1

Software and applications used fell into five broad categories: notetaking and organization, social media and sharing, research and practice, recording and editing and music creation. These categories for applications are illustrated in Table 2. Notability, Evernote and the Calendar app that comes with the iPad were used for notetaking and organization. Notability was found to be useful for notetaking during lectures because it allowed students to annotate the provided lecture notes directly in the app. It also easily allowed sharing between devices. Likewise, Evernote

allowed direct sharing between devices in any format. YouTube, Dropbox, Capture and iVideo were used in order for students to share video clips and notes with each other during rehearsals. YouTube was also used for research as it allowed students to find and analyse video recordings of their repertoire. Participant 40 shows how notetaking and data sharing worked in practice:

I sync my macBook with my iPhone and iPad. This way I have back-ups on the MacBook and both 'i' devices have the same content .e.g music, contacts, diaries and apps where applicable. Once the footage was stored in the macBook, I used its 'iMovie' programme, to select and copy brief clips from the overall film. This saves the clips as mp4 video files. They are much smaller in files size and thus easier to up-load to YouTube
(Participant 40)

Students used a number of apps for research and practice purposes. iBooks was used by one student to keep electronic copies of the texts used in lectures, otherwise apps were used for practice. Students used Metrotimer, an electronic metronome, to aid ensemble time keeping and coordination during rehearsals. Away from the rehearsals they used apps to aid their development as musicians, particularly Read Rhythm, Tenuto, Quiztones and Dacca which are all apps that allow the user to create drills for various aspects of music theory and music making.

Tenuto & Dacca: Brilliant for ear training Re: Intervals, Scales & Cadences. Recognition of intervals, chords on staff & fretboard or piano.
(Participant 5)

Recordings of the rehearsal process were made in the chosen device's inbuilt camera. Video recordings were then either uploaded to YouTube without further editing and then embedded in the ePortfolio as seen here:

No videos of mine were edited, although I used the YouTube app to upload the video.
(Participant 38)

Or they were edited for length and clarity using a suite of editing applications. These ranged from the easy to use, such as Windows Movie Maker, QuickTime and, for audio recordings, Voice Recorder, to professional editing applications such as Adobe Premier.

iMovie, as supplied for free on my MacBook Pro. This uploads straight to YouTube, makes things much easier.
(Participant 9)

Students used a variety of applications to create music during rehearsals. Most preferred of these was Garage Band. This was used to capture song ideas and create harmonies to hear how they sound. It was also used to capture rehearsal sessions in order to be able track the ensemble's progress. Likewise, Virtual Piano was used to play through harmonies to see how they sound. Notation was used because it was a quick and easy to use notation application that allowed an easy playback of ideas. Students found it to be more difficult to use than Finale but the portability was useful when needing to notate during rehearsal. Some applications were used to create musical effects to enhance performance. These were iVCS3, iMini, Modular, Audiobus, Loopy HD and Tabletop. iVCS3, iMini and Modular are all synthesizer emulators, used to bring timbres not available to acoustic instruments into performance. Loopy HD was used to create audio loops, and Tabletop and Audiobus

are virtual studios which allow the performer/composer to bring sounds from third party apps into sessions.

GarageBand: I use this app (and/or VoiceMemo on my iPhone) to capture song ideas as they come to me. It's great for testing out how harmonies will actually sound. Also great for replaying a private practice, to qualify/quantify improvements.
(Participant 4)

Table 3: Categories of Applications.

Note taking/ Organisation	Social media/ Sharing	Research/ Practise	Recording/ Editing	Music creation
Notability — 3	YouTube — 9	Read Rhythm — 2	iMovie — 12	Garage Band — 4
Evernote — 1	iVideo — 2	Metrotimer — 2	QuickTime — 6	iVCS3 — 2
Calendar — 1	Dropbox — 1	Tenuto — 2	Windows Movie Maker — 3	Notation — 2
	Capture — 1	Quiztones — 2	Voice Recorder — 2	Modular — 2
		Dacca — 2	Adobe Premier — 1	Virtual Piano — 2
		iBooks — 1		Audiobus — 1
				Loopy HD — 1
				Tabletop — 1
				iMini — 1

Conclusions

Unsurprisingly, all students used one or more mobile computing devices to create video of their rehearsal process for the ePortfolio task. Students also used a suite of applications for five distinct purposes: notetaking and organization, social media and sharing, research and practice, recording and editing and music creation. More surprising was the way that students used these devices and applications over the course of seven rehearsals. In previous semesters students have rehearsed in a linear way by starting at the beginning of the music and working their way through. Success was measured each rehearsal by the amount of bars that had been learnt (McPhee, in press). With the use of mobile computing devices we see a change from a linear rehearsal process to a problem based one. This could be due to the proposal that mobile computing devices have been found to be a mediator between students' informal and formal musical lives (Stowell & Dixon, 2014). "The mobile phone with its possibilities to search for information could be seen as an artefact at the intersection between formal and informal learning" (Wallerstedt & Hillman, 2015, p. 88). We see the devices being used to compose and record music to support the rehearsal, we see the use of recordings to measure the quality of rehearsal each week rather than amount of music learned as in previous years. We also see the use of looping, synthesizer and virtual studio apps to bring sounds and effects into the rehearsal beyond what is available acoustically.

References

- Brown, J. S. (2010). *A new culture of learning*. Paper presented at the New Media Consortium Summer Conference, Anaheim, California. Retrieved from <http://www.youtube.com/watch?v=B4FPH-Oo1iM>
- Burnard, P. (2012). *Musical creativities in practice*. Oxford: Oxford Scholarship Online.
- Erixon, P-O., Marner, A., Scheid, M., Strandberg, T., & Örtengren, H. (2012). School subject paradigms and teaching practice in the screen culture: Art, music and mother tongue (Swedish) under pressure. *European Educational Research Journal*, 11(2), 255–273.
- Goodwin, K. (2012). Use of tablet technology in the classroom. In NSW Curriculum and Learning Innovation Centre (Ed.), *Phase 1 iPad trial*. Strathfield, NSW: Department of Education and Communities.
- Harwood, E., & Marsch, K. (2012). Children's ways of learning inside and outside the classroom. In G. E. McPherson & G. Welch (Eds.), *The Oxford handbook of music education* (pp. 322–340). New York, NY: Oxford University Press.
- Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. (2004). Literature review in mobile technologies and learning. *FutureLab Report*, 11, 1–46.
- Order, S. (2015). 'iCreate': Preliminary usability testing of apps for the music technology classroom. *Journal of University Teaching & Learning Practice*, 12(4), 1–15.
- Puentedura, R. R. (2011). *The iPad and research design (data/research sessions I, II, III)*. Paper presented at Leveraging Learning: The iPad in Primary Grades, Auburn, ME.
- Rossing, J. P., Miller, W. M., Cecil, A. K., & Stamper, S. E. (2012). iLearning: The future of higher education? Student perceptions on learning with mobile tablets. *Journal of the Scholarship of Teaching and Learning*, 12(2), 1–26.
- Stowell, D., & Dixon, S. (2014). Integration of informal music technologies in secondary school music lessons. *British Journal of Music Education*, 21(1), 19–39.
- Tough, D. T. (2009). *Developing a consensus-driven, core competency model to shape future audio engineering technology curriculum: A web-based modified Delphi study*. Tennessee State University, UMI Dissertation Publishing.
- Wallerstedt, C., & Hillman, T. (2015). 'Is it okay to use the mobile phone?' Student use of information technology in pop-band rehearsals in Swedish music education. *Journal of Music, Technology & Education*, 8(1), 71–93.
- Wallerstedt, C., & Pramling, N. (2015). Playing by "the connected ear": An empirical study of adolescents learning to play a pop song using Internet-accessed resources. *Research Studies in Music Education*, 37(2), 195–213.

Biography

Eleanor McPhee

Eleanor McPhee has been an instrumental teacher and ensemble director for twenty years and was recently awarded her PhD in music from Western Sydney University for her investigation into the ways that instrumental teachers learn to teach. This thesis was awarded the Australian Society for Music Education Callaway Doctoral Award, presented on a biennial basis to the best doctoral thesis from an Australian university in the area of music education. Eleanor has taught into various areas of music skills and performance at the University of Wollongong, the Sydney Conservatorium of Music and Western Sydney University and currently teaches music skills at the University of Wollongong School of The Arts, English and Media. Eleanor has performed with a wide variety of ensembles, most recently The Moving Picture Show, a project that creates historical performances of silent films from the 1920s with live orchestra and sound effects.

Ready? Action! Building a portfolio of evidence in teacher education

Jennifer Masters

University of Tasmania

Abstract

The Teacher Education Ministerial Advisory Group (TEMAG) was convened in 2014 and was asked to recommend how initial teacher education in Australia might be reformed to better prepare teachers for teaching (TEMAG, 2014, p. v). The subsequent report, *Action now: Classroom ready teachers* (TEMAG, 2014) outlined some clear expectations for teacher education and accreditation in the coming years. Of particular interest to this audience was the key direction that pre-service teachers should be required to develop a 'portfolio of evidence' during their initial teacher education program in order to demonstrate that they have reached 'classroom readiness' by the time they graduate. This, according to the report, would confirm their eligibility for provisional registration and then they would be required to add to this portfolio as a beginning teacher in order to achieve full registration as a teacher. This short paper reflects on the status of portfolios in teacher education and then examines the recommendations from the TEMAG report that relate to the portfolio of evidence. In particular, Recommendations 26 (a national assessment framework linked to the portfolio), 27 (connections with the Australian Professional Standards for Teachers (AITSL, 2014)) and 28 (portfolio requirements during practicum) have significant implications for teacher education programs while Recommendation 33 (portfolio requirements for provisional teachers working towards full registration) will impact on induction in to the profession and ongoing professional development of teachers.

While the TEMAG report acknowledged that there are examples of excellence in Australian teacher education, it maintained that this innovation has been sporadic and therefore all teacher education providers will need to review their practice in accordance with the report recommendations. In the Faculty of Education at the University of Tasmania, we are examining all of our programs in line with the TEMAG report and consequently our implementation of ePortfolios across the teacher education courses. While we currently have some examples of innovative ePortfolio use, we don't yet have a clear and systemic implementation approach and therefore need to rethink how we can best enact the portfolio requirements emerging from the report. This paper, therefore, outlines the challenges that we face and describes the strategies we are considering in order to address the TEMAG recommendations.

Keywords: *teacher education, teacher standards, portfolio of evidence, TEMAG, ePortfolio*

Introduction

When the Teacher Education Ministerial Advisory Group (TEMAG) report: *Action now: Classroom ready teachers* was launched in February 2015, it sent shock waves through the teacher education community. While it acknowledged that there were pockets of innovation in some teacher education programs, it was evident that the advisory group considered that initial teacher education in Australia lacks quality and rigor and, as a consequence, the quality of graduating teachers has been compromised (TEMAG, 2014, p. xi). A particular aspect of the report related to the notion of evidence for expertise and competence. According to TEMAG, it is not enough for pre-service teachers to simply participate in teacher education curriculum or even complete assessment relating to this curriculum. They actually need to collect evidence of their progress in order to demonstrate how they have achieved learning outcomes and how they meet teaching standards. The TEMAG report identified that a 'portfolio of evidence' is required for this purpose. Further, it suggested that it is the responsibility of teacher education providers to facilitate the pre-service teacher in this process by incorporating the portfolio as assessment consistently throughout teacher education programs.

Although the concept of portfolios in education is certainly not new, the mandate of systemic portfolio integration is an alert for teacher educators, especially when statements such as "programs that do not produce effective teachers should not continue to operate" (p. xii) indicate that compliance with the report is not an optional extra. Teacher education providers have now had over 12 months to contemplate this report and, while there isn't a deadline for portfolio inclusion, there is evidence that the recommendations from the report are now filtering through to policy, for example, the Teacher Capability Assessment Tool (TCAT) required for all pre-service teacher applicants in 2017 and the Literacy and Numeracy Test for initial teacher education (ACER, 2016) that must be passed prior to graduation. It is anticipated that all teacher education courses will be subject to providing evidence of an integrated portfolio at the next accreditation point and so it is essential that teacher education providers are proactive in redesigning their programs to meet this requirement.

This paper illuminates the pathway towards ePortfolio implementation in the Faculty of Education at the University of Tasmania. It describes the positioning of portfolios in teacher education and then outlines how the TEMAG report references a 'portfolio of evidence'. The practicalities of implementing this portfolio as an ePortfolio in teacher education are reflected on and then the strategies to meet the TEMAG requirement in the Faculty are discussed. While the 'portfolio of evidence' may be seen by some as a tick-box for government requirements, we consider that it will require teacher educators, preservice teachers and schools to substantially change practice and this will have significant impact on teacher education.

Portfolios in Teacher Education

Portfolios have strong and established foundations in teacher education. In the late 1980s, when assessment practices in education shifted to an outcomes based approach, portfolios were seen as an appropriate way to demonstrate achievement of learning accomplishments (Davies & Le Mahieu, 2003). Over the last few decades, this genre of assessment has become main-stream in teacher education. Portfolios are used routinely in teacher education to capture learning experiences, present evidence of learning outcomes and to showcase reflective practice (Fox, White, & Kidd, 2011). Further, the portfolio is a familiar device in a practicum context where pre-service teachers gather and present evidence of their experiences in a classroom environment.

While portfolios were traditionally paper-based collections of resources and documents, the ePortfolio (or digital portfolio) is now more relevant for teacher education purposes. Maher and Gerbic (2009) suggest that an ePortfolio is more of a technological innovation rather than a conceptual one. While the purpose of the portfolio is largely the same, using a digital format means that content can be stored, manipulated and transported with greater ease. Further, the content is no longer restricted to a linear, printed format and can include multimedia such as audio, video and hyperlinks. Additionally, the digital format facilitates communication to a wider audience as a link can be emailed as required. Although the practical implementation comes with challenges, certainly the concept of using ePortfolios is in step with contemporary teacher education.

Given the wide acceptance of portfolios in teacher education, it is actually not surprising that this mechanism has been recommended by TEMAG. It is, however, the degree of accountability that rests with the portfolio, the prescriptive assessment requirements and the external directives that will require teacher educators to reexamine the positioning of the portfolio in teacher education courses.

Action now: Classroom ready teachers

The Teacher Education Ministerial Advisory Group (TEMAG) was established in 2014 by the Australian Government. The group consisted of eight educational experts who were asked to advise the then Education Minister (Christopher Pyne) on how initial teacher education might be improved and how pre-service teachers could be made 'classroom ready' by the time they graduated from their course. The *Action now: Classroom ready teachers report* (TEMAG, 2014) documented seven key directions for teacher education, offered five key proposals and made 38 practical recommendations for change. A number of items in the TEMAG report related to the concept of a 'portfolio of evidence' and these are presented in Table 1.

Table 1: TEMAG items relating to ‘portfolio of evidence’ (TEMAG, 2014).

Item	Content
Key Direction 5: Evidence of classroom readiness	Pre-service teachers building a Portfolio of Evidence throughout their initial teacher education program to demonstrate that they reach classroom readiness and eligibility for provisional registration. Beginning teachers add to their Portfolio of Evidence to achieve full registration. (p. x)
Key Proposal 4: Robust assurance of classroom readiness	...Robust evidence will be required of providers to show that their graduates have the knowledge and teaching practices needed to be classroom ready, against a national assessment framework. Pre-service teachers will also be required to collect evidence that they have the skills and capabilities for both graduation and employment. Graduate teachers must be supported to reach proficiency once they enter the profession. (p. xiii)
Recommendation 26	The Australian Institute for Teaching and School Leadership develop a national assessment framework, including requirements for a Portfolio of Evidence, to support higher education providers and schools to consistently assess the classroom readiness of pre-service teachers throughout the duration of their program. (p. xvii)
Recommendation 27	Pre-service teachers develop a Portfolio of Evidence to demonstrate their achievement of the Graduate level of the Professional Standards. (p. xvii)
Recommendation 28	Higher education providers and schools work together to assist pre-service teachers to develop and collect sophisticated evidence of their teaching ability and their impact on student learning for their Portfolio of Evidence. (p. xvii)
Recommendation 33	Beginning teachers build on their Portfolio of Evidence to reach full registration at the Proficient level of the Professional Standards. (p. xviii)

In a nutshell, the TEMAG report identifies that pre-service teachers will be required to develop a portfolio of evidence that is mapped against the Australian Professional Standards for Teachers at the Graduate level (AITSL, 2014) from the beginning of their teaching degree. This portfolio will incorporate evidence of their knowledge, skills and capabilities acquired during their program of study. Further, a student’s portfolio must also represent their teaching ability and their impact on student learning enacted during their practicum placements in school settings.

Implications of TEMAG for ePortfolios in Teacher Education

While a ‘portfolio of evidence’ doesn’t necessarily have to be a digital collection, it is likely that most teacher education providers will use this opportunity to implement course wide ePortfolios with their pre-service teachers. The prospect of implementing comprehensive portfolios on a wide scale would simply be too difficult to manage if the resources were paper-based. The advantages of having digital portfolio materials that can be stored in an approved cloud space and then linked for sharing are extensive and this option is really the only viable strategy for effective and pervasive deployment of portfolios, as described by TEMAG. Of course, the challenge for teacher educators is to develop a strategy for implementing this arrangement.

Most universities provide a range of digital tools for staff and students and these tools have varying capacities for building e-portfolios. The options available range

through digital systems that have been designed explicitly for evidence based ePortfolios (e.g. PebblePad), existing functionality in a learning management system (e.g. Blackboard), generic tools repurposed for portfolio application (e.g. OneNote or PowerPoint) and web-based generic website building tools (e.g. WordPress). However, just because a tool has potential to be used for portfolio purposes, it doesn't mean that students will intuitively know how to use it to build an ePortfolio. Teacher educators will need to completely rethink course assessment strategies, unit alignment and the development of academic literacies across courses in order to build a comprehensive ePortfolio approach that is fitting for the TEMAG requirements.

As the education community ponders what might be expected in terms of the TEMAG 'portfolio of evidence', it is interesting to watch the rise of entrepreneurial ventures that purport to provide ePortfolio solutions for Australian pre-service and post-graduate teachers based on the Australian Professional Standards for Teachers (AITSL, 2014) according to the TEMAG requirements. An example of this is Edufolios (edufolios.org), a hosting service with a yearly subscription that provides an "edufolio" template with tabs listing the standards where students can add posts. A similar, although less ambitious example is a website "shell" constructed in Weebly that is available for \$20.00 from the "Designed by Teachers" online market place (<http://designedbyteachers.com.au>). This approach may offer some options for preservice teachers, however it is unlikely that this type of resource will be a suitable to connect assessment tasks across a teacher education course.

ePortfolios in the Faculty of Education at UTAS

The Faculty of Education at the University of Tasmania offers seven different initial teacher education courses and these are individually accredited every five years through the Teachers Registration Board of Tasmania, although other bodies maybe involved, for example, the Australian Children's Education and Care Quality Authority (ACECQA) also accredits the early childhood courses. The accreditation process requires that each course is mapped against the Australian Professional Standards for Teaching (AITSL, 2014) and therefore the 'portfolio of evidence' is almost certainly going to be a requirement for future iterations.

The application of portfolios in the Faculty of Education has to date been intermittent. While each course has clear outcomes about reflective practice and knowledge development, there is currently no explicit requirement that students develop a portfolio of evidence as a Faculty-wide mandate. There are, however, pockets of innovation where ePortfolios are clearly an integral part of the program, for example in the Bachelor of Adult and Applied Learning. In this course, the students undertake a unit called "Foundations of Professional Learning" in their first semester where the ePortfolio is initially established and then students progressively build on it throughout their course.

A particular challenge that the Faculty faces at the moment is that there isn't an obvious digital technology platform for ePortfolio construction nor do teacher educators have the option to request a dedicated tool. This means that the focus has been on identifying digital tools that are currently available to pre-service teachers and teacher educators in the Faculty to see what might be fit for purpose or at least

be suggested as an option for ePortfolio construction. A line of enquiry has been based on the availability of Office 365 for all staff and students in the University. While none of the digital tools provided in Office 365 are considered really adequate for systematic ePortfolio implementation, in 2016, the majority of first year pre-service teachers were introduced to OneNote as an 'eScrap-booking' tool for collecting content and reflections. The students were also encouraged to use OneDrive for cloud storage for their University content during their course. This will at least mean that they have practice at collecting and storing materials relating to their study.

In order to encourage existing ongoing ePortfolio work across the courses, the interim approach has been to inform both pre-service teachers and teacher educators about the importance of ePortfolios and particularly the implications of the TEMAG report. A generic web-based resource has been provided to describe the process of portfolio construction (see Figure 1) and explain the TEMAG requirements.

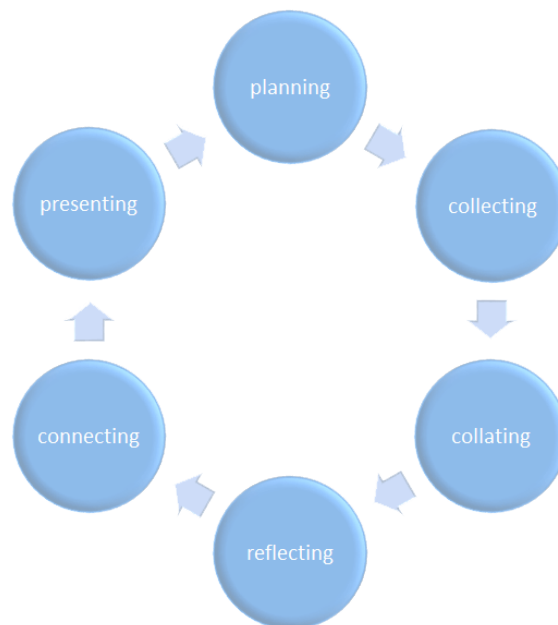


Figure 1: The cycle of ePortfolio construction suggested to pre-service teachers.

In terms of the digital tools to use though, this resource offers a 'bring your own device' approach to ePortfolio construction. It recommends a range of possible software options and links to web-based support materials but does not actually specify what environment should be used. The justification for this approach can somewhat be attributed to the lack of confidence in the tools that are currently available through the University. It is perhaps better not prescribe a portfolio mechanism when there is little conviction that this choice is suitable or even adequate. An advantage of this tack too, is that students are encouraged to be proactive in their ePortfolio development. They are entering a profession that is highly influenced by politics and Government decrees and they need to take responsibility for being aware of requirements and respond accordingly. By not have tools stipulated, they are being asked to consider the requirements and then decide what method will work for them. This is quite logical, given that the TEMAG

requirements extend beyond teacher education in to their employment as a beginning teacher.

Conclusions

It is evident that the TEMAG report has significant implications for the direction of teacher education and that the 'portfolio of evidence' will be a substantial task that will frame the design of courses in teacher education. It is obvious that teacher educators will be required to take responsibility for ensuring that the portfolio is embedded in course design and assessment and that courses that do not meet these requirements will not be accredited.

While it hasn't been specified that the 'portfolio of evidence' is a digital resource, ie. an ePortfolio, this should be taken as a given. It would be virtually impossible to manage an implementation of this magnitude in any way other than through electronic storage and digital documents. This means that teacher educators need to give considerable attention to how these materials will be created, manipulated, shared and stored. Further, teacher educators need to be mindful of the tools that pre-service teachers will use for this task and they will need to develop their own skills and confidence to mentor their students through this process.

In addition, the pre-service teachers themselves need to take on an ownership of the 'portfolio of evidence'. This resource will be a representation of their learning journey as a teacher and they need to be responsible for ensuring that it provides convincing evidence that they are qualified to teach and are indeed 'classroom ready'. They also need to recognise that this portfolio is only the beginning of their documentation. The TEMAG report flags that teaching is a profession under transformation and that accountability and professionalism will be an ongoing requirement for their career.

The TEMAG report heralds a change in the way that all teacher education providers design, implement and assess teacher education programs and the ePortfolio needs to be a central concept in this reform. This means that every teacher education institute needs to consider how they will embed the ePortfolio so that it becomes the frame for curriculum, rather than a peripheral activity that is added to existing programs. While this type of course reform is often undertaken behind closed doors, with one eye on other providers, the ultimatums presented in TEMAG report are perhaps too significant to face in isolation. The teacher education community may be best served to work collaboratively on this challenge in order to completely reinvent teacher education for these new and demanding expectations.

References

- ACER. (2016). *Literacy and numeracy test for initial teacher education students*. Retrieved from <https://teacheredtest.acer.edu.au/>
- Australian Institute for Teaching and School Leadership (AITSL). (2014). *Australian professional standards for teachers*. Retrieved from <http://www.aitsl.edu.au/australian-professional-standards-for-teachers>

- Davies, A., & Le Mahieu, P. (2003). Assessment for learning: Reconsidering portfolios and research evidence. In M. Segers, F. Dochy, & E. Cascallar (Eds.), *Innovation and change in professional education: Optimising new modes of assessment: In search of qualities and standards* (pp. 141–169). Dordrecht: Kluwer Academic Publishers.
- Fox, R., White, S., & Kidd, J. (2011). Program portfolios: Documenting teachers' growth in reflection-based inquiry. *Teachers and Teaching: Theory and Practice*, 17(1), 149–167.
- Maher, M., & Gerbic, P. (2009). E-portfolios as a pedagogical device in primary teacher education: The AUT university experience. *Australian Journal of Teacher Education*, 34(5), 42–53.
- Teacher Education Minister's Advisory Group (TEMAG). (2014). *Action now: Classroom ready teachers*. Canberra: Department of Education. Retrieved from <http://www.studentsfirst.gov.au/teacher-education-ministerial-advisory-group>

Biography

Jennifer Masters

Jennifer Masters is an academic and a researcher who specialises in the use of digital technologies in education. She has an eLearning focused position in the Faculty of Education at the University of Tasmania and is based in Launceston. Her research interests include creative and the applied use of computers, informal learning and social constructivism, mobile learning and notions of ethical digital citizenship. She has used ePortfolios in teacher education for many years as a device to represent the learning journey.

Digital scholarship powered by reflection and reflective practice through the use of an ePortfolio approach to course design in Higher Education

Judy O'Connell

Charles Sturt University

Current online information environments and the associated social and pedagogical transactions within them create an important information ecosystem that can and should influence and shape the professional engagement and digital scholarship within our learning communities in the higher education sector. Thanks to advances in technology, the powerful tools at our disposal to help students understand and learn in unique ways are enabling new ways of producing, searching and sharing information and knowledge. By leveraging technology, we have the opportunity to open new doors to scholarly inquiry for ourselves and our students. While practical recommendations for a wide variety of ways of working with current online technologies are easily marketed and readily adopted, there is insufficient connection to digital scholarship practices in the creation of meaning and knowledge through more traditional approaches to the 'portfolio'. In this context, a review of the portfolio integration into degree programs under review in the School of Information Studies led to an update of the portfolio approach in the professional experience subject to an extended and embedded e-portfolio integrated throughout the subject and program experience. This was done to support a strong connection between digital scholarship, community engagement, personal reflection and professional reflexive practices. In 2013 the School of Information Studies established CSU Thinkspace, a branded WordPress solution from Campus Press, to better serve the multiple needs and learning strategies identified for the Master of Education programs. The aim was to use a product that replicates the authentic industry standard tools used in schools today, and to model the actual ways in which these same teachers can also work in digital environments with their own students or in their own professional interactions. This paper will review how the ePortfolio now provides reflective knowledge construction, self-directed learning, and facilitate habits of lifelong learning within their professional capabilities.

E-learning in higher education

Distance education and distance learning at Charles Sturt University, once undertaken by one-to-one correspondence between learners and teachers has been radically transformed into online learning, or e-learning, through the use of learning management systems and other web based or digital tools. Now this type of education is characterized not so much by 'distance' as by the mode of 'electronic' or 'e' learning environments that is internet or web-based, and provides ongoing challenges for the researcher investigating professional contribution (i.e. teaching or educating) in higher education (Thompson, 2007, p. 11).

Distance education has evolved through many technologies, in tandem with the affordances these technologies provided, and each mode or 'generation' has required

that distance educators and students be skilled and informed to select the best mix(es) of both pedagogy and technology (Anderson & Dron, 2011). The current generation of academic degree programs which are delivered fully online (rather than face-to-face) through the use of information and communication technology (ICT) are doing more than simply delivering content through asynchronous distance education modes. Rather, there has been a strong move to creating pedagogically enriched learning design within technology-rich contexts to support and improve learning experiences (Ally, 2004; Kim & Bonk, 2006; Siragusa et al., 2007; Beetham & Sharpe, 2013).

Digital scholarship

Learning in a digital age requires practitioners who understand education imperatives in local and global settings, and who can demonstrate an agile response to novel technologies that may catalyze learning. The proliferation of digital content is part of the change in scholarly communication. Digital literacy can enable digital scholarship, but the nature of digital scholarship is dependent on emergent practices, processes and procedures of scholarly communication conducted via digital domains. While knowledge generation and sharing is deeply rooted in academic scholarship, it is necessarily being transformed in the parameters of enactment through digital scholarship contexts, with disjuncture between informal processes of scholarly communication and formal systems of dissemination and publication for knowledge dissemination (Goodfellow, 2013).

Digital scholarship is valued for openness or open access within the boundaries of open data, open publishing, open education and open boundaries (Pearce et al., 2012; Weller, 2011), and for utilising participatory or collective ways of thinking (Jenkins et al., 2009; Bull et al., 2008). Our work as educators has to centre on helping to meet the scholarship and future learning needs in courses/programs by fostering a culture of enquiry within a sustainable digital learning environment that is shaped by the ubiquity of information, globally responsive pedagogical practices, and driven by collaboration and informal learning in multiple access points and through multiple mediums. The impact of technology has emerged as complicated and disruptive while being highly relevant and transformative. Thanks to advances in technology, the powerful tools at our disposal to help students understand and learn in unique ways are enabling new ways of producing, searching and sharing information and knowledge (Conole, 2013). By leveraging technology, we have the opportunity to open new doors to scholarly inquiry for ourselves and our students.

Reflection on practice

A key area in the development of the professional practitioner is the ability to reflect on practice as the basis for learning, with the effectiveness of this practice having been confirmed through research to be linked to inquiry, reflection and continuous professional growth (Killeavy & Moloney, 2010). Reflection can be understood as a process of internal dialogue facilitated by thinking or writing and through an external dialogue and reflection together with others (Clarke, 2003). Reflective practice writing is creative, a way of gaining access to each practitioner's deep well of experience not always accessible to everyday channels and is a valuable mode of expressing, sharing,

assessing and developing professional experience (Bolton, 2005). By recognising and taking responsibility for personal and professional identity, values, action and feelings the student undertaking reflection within the constructs of subject and program requirements is demonstrating a willingness to stay with uncertainty, doubt and questioning in order to engage in spirited enquiry leading to constructive developmental change and personal and professional integrity based on deep understandings (Bolton, 2010, p. 7). Knowing what to reflect upon is as critical a part of the educative process as the reflection action itself, perhaps explaining why reflective practice has become a standard in initial and continuing professional education and development. This is a pedagogical approach that draws together reflective practice and reflexivity (finding strategies to question our own attitudes, values and limits of our knowledge — Bolton, 2010) as a state of mind to empower the process of learning.

In professional programmes in particular, it is useful if students keep a reflective journal, in which they record any incidents or thoughts that help them reflect on the content of the course or programme. Such reflection is basic to proper professional functioning. The reflective journal is especially useful for assessing ILOs (intended learning outcomes) relating to the application of content knowledge, professional judgment and reflection on past decisions and problem solving with a view to improving them.

(Biggs & Tang, 2011, p. 261)

It is perhaps simplistic to migrate a pre-digital taxonomy to a digital environment and to ignore the function of and relationship to digital scholarship for the educator or higher education academic. When it comes to online learning, it is understood that interaction with others (peers and instructors) is a highly important variable in successful learning experiences within the online learning environment, particularly when coupled with the need for students to achieve self-regulation between their own knowledge/experiences and the content of a subject (Cho & Kim, 2013). This reflective practice, which assists in assembling knowledge and experience in meaningful ways, can be facilitated by the use of an ePortfolio, and may facilitate independent learning, development of identity, a sense of empowerment, greater awareness of self, and promote active engagement in future oriented professional practice (Rowley & Munday, 2014).

The digital information environment in which an ePortfolio is situated is one that demands a new knowledge flow between content and digital connections. While academics may consider themselves to be pedagogically driven in their learning and teaching, the availability of technologies to support different models of learning strongly influences what kinds of pedagogies will now emerge in terms of course content, subject dialogue and conversation. As McLuhan (1964) first argued, technologies also influence and define the usage, in this case the pedagogy instantiated in the learning and instructional designs (Anderson & Dron, 2010). Academics (as teachers) need to support and nurture learners to learn within connected and collaborative learning environments, to lead purposeful and corrective discourse in relation to multiple information environments as part of the construction of meaning and understanding (Garrison, 2015).

Context for introduction of the ePortfolio

During 2012–2013 a comprehensive Course Review of the Master of Education (Teacher Librarianship) was undertaken, as part of the 5-year cyclic renewal process for an authorized Australian University (under the Tertiary Education Quality and Standards Agency [TEQSA] Act) to self-accredit each degree program that leads to a higher education award that the provider confers.

As part of the face-to-face and virtual industry-wide focus-group consultation processes with key stakeholders across Australia and New Zealand (principals, teacher librarians, librarians, system leaders, teachers, education consultants) a key finding in focus group results emphasised a need for a *substantial post-graduate foundation in connecting information knowledge networks and digital innovation in the P-12 and tertiary education environments*, where the information discipline aspect is foundational to improved education pedagogical practices in digital environments.

As a result of this comprehensive review, the Master of Education (Teacher Librarianship) underwent a substantial change in relation to portfolio use. At the same time a new degree program was developed called the Master of Education (Knowledge Networks and Digital Innovation) — MEd(KN&DigInnov).

A unique feature of both degree programs was a review of the digital networked participatory learning experiences, collaborative activities, assessment practices, and the incorporation of reflective approaches to discipline learning and workplace learning experiences. These critical elements of online learning and teaching of necessity placed an emphasis on interaction between students as well as student learning that is designed to be collaborative, synchronous and/or asynchronous in the context of inquiry-based or problem-based learning designs, aligned to assessment tasks, including the co-creation of authentic learning products (addressing the need for enhanced *learner-learner* engagement).

The MEd(KN&DigInnov) has also been designed to enhance personal professional networks and personal learning conversations, understanding that learning is social within Communities of Practice where learning happens through experience and practice as part of a community (Lieberman & Mace, 2009). Each subject is treated as an intensive professional development program, facilitated by social interaction through forums, twitter, Adobe Connect, and other synchronous and asynchronous activities, helping to facilitate greater insight into generic issues (Rienties & Kinchin, 2014) through the various participatory learning experiences. A critical ‘game-changer’ in this initiative was the introduction of an ePortfolio approach embedded within the program design.

CSU Thinkspace for an ePortfolio approach

Both degree programs have embedded within each subject a reflective and reflexive journaling process undertaken at the CSU Thinkspace <http://thinkspace.csu.edu.au> platform, which was developed for the ePortfolio approach in response to the review. *Thinkspace* is hosted by Edublogs *Campus Press* and is a multisite installation of WordPress.

A reflective journal is used in each subject, and provides an opportunity for students to demonstrate functioning knowledge in the context of the intended learning outcomes for the subject or program. Students are regularly required to reflect upon their practices, link their reflections to theories and communicate in writing an understanding of the connection between the reflection and theory. This encourages each student to become a proactive learner and reflective educator who is “committed to continuous improvement in practice; assumes responsibility for his or her own learning; demonstrates awareness of self, others, and the surrounding context; develops the thinking skills for effective inquiry; and takes action that aligns with new understandings” (York-Barr, Sommers, Ghere, & Montie, 2006, p. 10).

Reflective thinking helps students develop a questioning attitude and new perspectives, identify areas for change and improvement, respond effectively to new challenges, and generalise and apply what they have learned from one situation to other situations (Turner, Reid, & Shahabudin, 2011). This experiential engagement is employed to foster creativity and initiative for new situations in connected environments for professional practice, and a capacity for confident personal autonomy and accountability in knowledge networking.

Approaches to assessment focus on participatory and digital experiences, in the context of program requirements, and include extensive use of formative 0% marks activities, recorded in the ePortfolio, as part of knowledge flow and peer-to-peer learning/engagement.

The ePortfolio allows students to use the space for personal reflection, as well as undertake assessments, responses to activities, or create artefacts and/or products as part of the learning experiences. In addition, one degree program that requires professional placement and workplace learning, ensures that the ePortfolio can integrate a full record of activities as required. Many students keep an open and public record of their learning, e.g. <http://thinkspace.csu.edu.au/hyacinth/> providing an easy (and open) way to see the range of digital learning/assessment experiences alongside a record of their participatory experiences and online interactions, in keeping with the global participatory nature of the program.

Implementation strategies

Students are introduced to the ePortfolio in the keystone subject, Following AQF guidelines to include keystone subjects and capstone experiences, the introduction of the ePortfolio commences in the first common core subject. By the introduction of the Thinkspace ePortfolio approach within the keystone subject, it then became possible to build a repository of knowledge and experiences, assessment items and reflection, concluding with a whole program review within the ePortfolio as part of the capstone experience. The capstone experience needs to draw upon the sound introduction of reflective journals in the keystone subject, with a continuation of this embedded in all the subjects. This allows for not only informal student writing, but also targeted assessments within the ePortfolio in some subjects, with all subjects including a reflection added as an element of the last assessment. Curriculum alignment has been essential to streamline the reflective journal approach, in order to nurture the learning experiences throughout the program.

Key implementation strategies included the following:

- The keystone subject needs to ensure that both teaching practice, module introductions and engagement with Thinkspace supports the introduction and subsequent development of reflective journaling;
- Marks are not allocated *during* a subject to blog or journal activities, but should focus on the final reflection. It is important to continually review how we teach with, provide instruction to, and support students in the subject experience in relation to reflective journaling;
- Reflective journaling is promoted as an opportunity for students to explore, ask questions, respond to readings, summarize key ideas, recognise strengths and weaknesses in their emerging professional understanding and practices; and
- Subjects model the 'capstone' process during each subject by allocating a small percentage mark to a final learning outcomes Reflective Post as a culmination of student engagement in the subject within the final assessment. This provides formative assessment alignment leading students to the last capstone subject.

Learning and teaching strategies that are recommended included the following:

- Learning about and engaging with the digital affordances of the ePortfolio platform models authentic professional experiences;
- While students are also engaging in other synchronous and asynchronous activities., students should not be asked to cut and paste blog posts and place them into a discussion forum, or vice versa. However, some students do like to share their ideas, and how they do this in relation to a blog post is up to them. Often this is done by beginning a forum post with "I have just written a post about..." providing a link and commenting on why that post has been important to their emerging understanding of the discipline.
- No marks are specifically allocated to Forum participation or specific blog posts during the subjects, because students should have freedom as professionals to engage without embarrassment or criticism.
- Introducing and managing quality reflective journal practices within this context requires discussion, explanation and modelling for students, particularly where they have no prior experience in this process. The subject modules should provide examples or links to practice in this area drawn from past students, course lecturers, and practitioners, for example
 - Doug Johnson, *The Blue Skunk Blog*, <http://doug-johnson.squarespace.com/>
 - Lyn Hay, *Student Learning Through School Libraries* <http://studentslearn.wordpress.com/>
 - Jenny Luca, *Lucaccept: Intercepting the Web* <http://jennyluca.com>
 - Judy O'Connell, *Heyjude, Learning in an Online World* <http://judyoconnell.com/>

Assessment activities in the ePortfolio

The Thinkspace ePortfolio approach allows a unique blend of open and participatory dialogue and formative learning outcome e-assessments. ePortfolios support reflective and purposeful knowledge construction, and self-directed learning.

Thinkspace ePortfolios provide:

- Both the discipline and the freedom of structure, allowing students to see and share their work;
- The opportunity to assess personal strengths and weaknesses through examination of a collection of examples and review of subject experiences;
- The opportunity to share build collaborative knowledge and understanding, and share assessment products;
- A framework and process of self-assessment that leads on to setting goals for future development and professional growth.

Through the Thinkspace platform students demonstrate an overall integration of engagement with reflective and reflexive practice which are supported by opportunities to:

- Build open access products together e.g. Game-based learning compendium <http://thinkspace.csu.edu.au/gblcompendium/>;
- Build curriculum rich digital artefacts e.g. Things that Matter <http://thinkspace.csu.edu.au/lisa/category/inf533/>;
- Build comprehensive capstone Program reflection e.g. <http://thinkspace.csu.edu.au/melissawaldronlamotte/2015/07/26/etl-507-final-reflective-portfolio/>;
- Build a record of professional study visits e.g. <http://thinkspace.csu.edu.au/susanne/2015/06/25/gold-coast-study-visit-2015/>
- Build a record of workplace activities e.g. <http://thinkspace.csu.edu.au/susanne/2015/02/25/library-placement-report/>; and,
- Build digital scholarship transactions e.g. <http://thinkspace.csu.edu.au/fromheretothere/2015/09/26/digital-scholarship-an-interpretive-discussion/>.

Students have utilised participatory and collaborative tools and approaches throughout the subjects, with many learning for the first time how to engage at this level. The participatory nature of the use of Thinkspace was neatly highlighted in the first year of the use of Thinkspace (and the new focus in the subjects) by the public sharing via Twitter hashtag #INF530 for a Keystone subject, with a bottom-up praxis emphasised by a willingness of students to post a link to their assessments, via their reflective blog — even before the assessment was marked! After the assessments were marked, regardless of the grade level achieved, even more students willingly shared their work. A highlight for students was when an assessment went ‘viral’, being picked up by some knowledgeable people and organisations. <http://thinkspace.csu.edu.au/hbailie/2014/06/04/going-viral/>

Conclusion

The design of degree program with an integrated ePortfolio approach transformed the program from a collection of subjects with a final professional experience portfolio requirement into a portfolio-enhanced learning program where students graduate with evidence of their personal and professional capabilities in their new discipline field. The use of Thinkspace, as an ePortfolio, is in its third year of implementation within the two programs that adopted and embedded the use of this tool. As a result of the experiences to-date, the use of Thinkspace will be continuing, after a comprehensive program review undertaken in the first half of 2016.

In addition, the use of Thinkspace for reflective practice and ePortfolio use has been expanding across the university and is now included in a number of other degree programs within the Faculty of Business and the Faculty of Arts and Education. There are also plans to introduce the tool for ePortfolio use in the Faculty of Science. Using a flexible and authentic tool (using WordPress) hosted by Campus Press has provided an authentic and reliable ePortfolio tool, that has allowed the digital affordances of such an environment to support multimodal approaches to reflective practice and digital participatory networked learning experiences. The digitally curated experiential ePortfolio approach using CSU Thinkspace promotes digital identity and digital scholarship as an important component of professional practice/s within the discipline. Thinkspace ePortfolios have provided a unique way to enter into the multiple layers of learning and teaching for intended learning outcomes, and also support reflection and reflective practice during and beyond a degree program.

References

- Ally, M. (2004). Foundations of educational theory for online learning. In T. Anderson & F. Elloumi (Eds.), *Theory and practice of online learning*. Athabasca, Canada: Creative Commons Athabasca University.
- Anderson, T., & Dron, J. (2010). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning*, 12(3), 80–97.
- Beetham, H., & Sharpe, R. (Eds.). (2013). *Rethinking pedagogy for a digital age: Designing for 21st century learning*. London: Routledge.
- Biggs, J., & Tang, C. (2011). *Teaching for quality learning at university*. Open university press.
- Bolton, G. (2005). How to begin writing. In *Reflective practice: writing and professional development* (2nd ed., pp. 141–162). London, UK: Sage.
- Bolton, G. (2010). *Reflective practice: Writing and professional development*. London, UK: Sage.
- Bull, G., Thompson, A., Searson, M., Garafalo, J., Park, J., Young, C., et al, (2008). Connecting informal and formal learning experiences in the age of participatory media. *Contemporary issues in technology and teacher education*, 8(2), 100–107.

- Cho, M. H., & Kim, B. J. (2013). Students' self-regulation for interaction with others in online learning environments. *The Internet and Higher Education*, 17, 69–75.
- Clarke, M. (2003). *Reflections: Journals and reflective questions a strategy for professional learning*. NZARE/AARE Conference, New Zealand.
- Conole, G. (2013). *Designing for learning in an open world*. New York, NY: Springer.
- Garrison, D. R. (2015). *Thinking collaboratively: Learning in a community of enquiry*. London: Taylor & Francis.
- Goodfellow, R. (2013). The literacies of 'digital scholarship' — truth and use values. In R. Goodfellow & M. R. Lea (Eds.), *Research into higher education: Literacy in the digital university: Learning as social practice in a digital world*. Florence, KY: Taylor and Francis.
- Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robinson, A. J. (2009). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge, MA: The MIT Press.
- Killeavy, M., & Moloney, A. (2010). *Reflection in a social space: Can blogging support reflective?*
- Kim, K. J., & Bonk, C. J. (2006). The future of online teaching and learning in higher education: The survey says. *Educause Quarterly*, 29(4).
- Lieberman, A., & Mace, D. P. (2010). Making practice public: Teacher learning in the 21st century. *Journal of Teacher Education*, 61(1–2), 77–88. doi:10.1177/0022487109347319
- McLuhan, M. (1964). *Understanding media: The extensions of man*. New York, NY: McGraw Hill.
- Pearce, N., Weller, M., Scanlon, E., & Kinsley, S. (2012). Digital scholarship considered: How new technologies could transform academic work. *Education*, 16(1). Retrieved from <http://ineducation.couros.ca/index.php/ineducation/article/view/44>
- Rienties, B., & Kinchin, I. (2014). Understanding (in)formal learning in an academic development programme: A social network perspective. *Teaching and Teacher Education*, 39, 123–135.
- Rowley, J., & Munday, J. (2014). A 'sense of self' through reflective thinking in ePortfolios. *International Journal of Humanities Social Sciences and Education*, 1(7), 78–85.
- Siragusa, L., Dixon, K. C., & Dixon, R. (2007). Designing quality e-learning environments in higher education. In Proceedings ASCILITE. Retrieved from <http://cms.ascilite.org.au/conferences/singapore07/procs/siragusa.pdf>
- Thompson, M. (2007). From distance education to e-learning. In R. Andrews & C. Haythornthwaite (Eds.), *The SAGE handbook of e-learning research* (pp. 159–179). London, UK: SAGE Publications. doi:http://dx.doi.org.ezproxy.csu.edu.au/10.4135/9781848607859.n7

- Turner, J., Reid, M., & Shahabudin, K. (2011). *Reflective thinking. In Practice-based learning 1*. Reading, UK: Study Advice and Maths Support, University of Reading. Retrieved from http://www.reading.ac.uk/web/FILES/sta/A5_Practice-based_learning_1_Reflective_Thinking.pdf
- Weller, M. (2011). *The digital scholar: How technology is transforming scholarly practice*. London UK: Bloomsbury Academic.
- York-Barr, J., Sommers, W. A., Ghere, G. S., & Montie, J. (2006). *Reflective practice to improve schools: An action guide for educators* (2nd ed.). Thousand Oaks, CA: Corwin.

Biography

Judy O'Connell

Judy O'Connell is the Project Manager, Online Subject Enhancement in the Faculty of Education. Previously Judy was Courses Director in the School of Information Studies where she also engaged in leadership initiatives in online environments to further digital scholarship initiatives. Her professional leadership spans school and tertiary education, with a focus on libraries, learning spaces, online learning design, innovation, social media and technology for learning and teaching. She has also been a member of the NMC K-12 Horizon Report Advisory Board since 2009, and likes to stay in touch with emerging technologies, particularly in relation to learning experiences. Judy writes online at <http://judyoconnell.com>

Portfolios for success: Guiding students' ability to understand and articulate their skills and achievements

Heather Pate

Centre for Learning and Teaching / Edith Cowan University

Abstract

In 2016, Edith Cowan University introduced a course-long employability pilot for first year students in eight courses from the eight Schools around the university. The aim of the pilot is to improve employability among Edith Cowan University students by explicitly teaching Course Learning Outcomes throughout the course and giving students regular opportunities to recognise their learning through integrative learning tasks. To support this process, a PebblePad workbook, gradCAP, has been created to guide students from first year through to their final year. Using a blended learning approach, students are given opportunities to articulate experiences related to their course learning outcomes and to identify what skills they have drawn upon through these experiences. Stories and evidence are collated throughout the course and used to build a showcase portfolio in their final year that can be shared with potential employers.

Keywords: *employability, integrative learning, scaffolded learning, pedagogy, assuring learning*

Introduction

Supporting students through the process of recognising their professional learning in a higher education setting can be challenging. When students must rely on being able to articulate this learning to others to move forward into the workforce, the challenge is even greater. At Edith Cowan University, we are piloting a method of scaffolding student learning throughout their course using an ePortfolio system to help students become strong, independent graduates, confident in the knowledge, skills and achievements they can offer their profession. Using integrative learning techniques embedded within a PebblePad workbook (Graduate Course Action Plan [gradCAP]), students will be given explicit opportunities to make verbal and written connections between their experiences inside and outside their course and to collect evidence of achievements. As a result of this, written descriptions and evidence can be collected over time and used to construct a showcase portfolio before graduation. It is hypothesised that through having multiple opportunities to verbally describe their experiences and identify their skills, students will improve their ability to confidently articulate their knowledge upon graduation.

Background

Since the 1970s, the idea of employability as a university outcome has become increasingly important (Becker, 1975; National Committee of Inquiry into Higher Education, 1997; Mayer, 1992; Australian Government, 2002). Reports indicate that

industry has identified a lack in generic employability skills among graduates (Lowden, Hall, Elliot, & Lewin, 2011), leading to a push for these skills to be covered within the tertiary course (Department of Industry, Innovation Climate Change, Science, Research and Tertiary Education (DIICCS RTE) & Department of Education, Employment and Workplace Relations (DEEWR), 2013). While clearly, there is a need for students to enter the workforce with generic employability skills, it has also been found that explicitly teaching these employability skills does not improve students' employability on graduation (Mason, Williams, Cranmer, & Guile, 2003; Cranmer, 2006).

Currently, fulltime employability rates for graduating students have dropped throughout Australia. As shown in Table 1, at a national level, the number of graduating students with fulltime positions fell from 76.1 percent to 68.9 percent. This is a drop of 7.2 percent. The effect has been even more marked in Western Australia, where the number of students being employed has dropped from 79.2 percent to 65.6 percent since 2012, which is a drop of 13.6 percent.

Table 1: Full-time employment — graduating students (Australian Graduate Survey, 2015, cited by (Planning, Quality and Equity Services Centre, Edith Cowan University, 2016).

Survey year	2012	2013	2014	2015	Change 2012–2015
Western Australia Average	79.2	73.2	65.4	65.6	13.6
National Average	76.1	71.3	68.1	68.9	7.2

Despite this decrease in employability of graduates, positions are available. In 2014, Graduate Careers found that only two-thirds of graduating students' written applications were considered to be 'good' or 'very good' by employers. Of students who were interviewed, employers felt that little over three-quarters of graduating students were considered to be 'good' or 'very good' (Table 2). When asked whether more applicants would have been employed had acceptable graduates been available, 23 percent of employers said that they would (Graduate Careers, 2014). This shows that despite successfully completing their studies, a number of students are not being employed, because they are unable to articulate in writing or verbally what it is that they know or can do. Giving students opportunities to recognise their learning and development and time to practise articulating their knowledge, skills and achievements is clearly an area that can support students' future employability.

Teaching students the skill of how to develop their metacognitive abilities (Nilson, 2013) through learning how to transfer knowledge, self-regulate and critically self-reflect can help students recognise what it is they know and can do (Crebert, Bates, Bell, Patrick, & Cragolini, 2004). Integrative learning techniques, where students have opportunities to make connections between their prior knowledge, their ongoing learning, and their experiences to their study (Schneider, 2004) can be embedded into a course to support students on this journey (Huber & Hutchings, 2004).

Table 2: Employer rating of standard of graduate applications (Graduate Careers, 2014).

Aspect of graduate recruitment campaign	Good or very good
Number of applications received	79.1%
Standard of applications received	63.1%
Standard of candidates seen during selection process	76.4%
Standard of candidates accepting a position	89.2%
Overall rating of graduate recruitment campaign	80.0%

Approach

The Edith Cowan University Employability Strategy (Edith Cowan University, 2015) is currently being piloted course-long in seven courses from different Schools around the university. The focus is on giving students opportunities to take part in integrative learning activities. These activities are linked to supporting students recognise their knowledge, skills and achievements in relation to their degree and future profession. The tasks are linked to a course-long PebblePad workbook, named gradCAP (Graduate Career Action Plan), where students can develop and gather stories, as well as collate evidence to support these stories. In the final year of the degree, the students use these stories and evidence to create a showcase portfolio to demonstrate their abilities.

The strategy looks at how integrative learning can be used to scaffold student learning throughout their course from first year, linking generic employability skills, to course learning, and to the students' future professions. The desired outcome of this approach is for students to be able to recognise their own learning, have evidence to support this learning and to be able to articulate their knowledge, skills and achievements upon graduation. To allow for differences in methodology and terminology in different courses, the gradCAP is adapted to suit the needs of each course.

Two of the courses that are using the ECU gradCAP workbook are Speech Pathology and Engineering. In both courses, students are given tasks at the beginning of their course requiring them to consider their prior knowledge, including key skills, goals and experiences. Along with this, students are informed of their Course Learning Outcomes upfront. This follows aspects of the USEM (Understanding, Skills, Efficacy beliefs and Metacognition) model of employability (Yorke & Knight, 2004). By being given an opportunity to contemplate their prior knowledge and experiences, students can consider what they already know, what skills they bring to the course, and what they aim to achieve by attending the course. Students are given opportunities to speak and write about these experiences, which both prepares students for the course and helps them articulate skills they already have and goals that they have set themselves.

Using a blended approach, Course Learning Outcomes are explicitly introduced and practised throughout the course in units where the Course Learning Outcome, or an

aspect of the Course Learning Outcome is covered. As Course Learning Outcomes are frequently quite dense with abstract language making them difficult for the reader to understand, each Course Learning Outcome is rephrased as an embodied moment for the student to consider.

For example, the Course Learning Outcome in a writing course might be:

Collaborate in team project settings to produce measurable outcomes and evaluate team processes.

Within a unit where this Course Learning Outcome is covered, this may be rephrased at the beginning of the semester as:

Think about a time when you worked in a team to get something done.

At the end of the semester, after students have been given opportunities to work in writing teams, this may be rephrased as:

Think about three times this semester when you worked with a team of writers to get something done.

Students describe each experience with a partner and together draw out the skills the student has utilised in the experience they are describing. These tasks provide students with opportunities to consider again their previous experience and skills and link these to the new knowledge, skills and achievements they gain throughout their course (Peet, 2013). By talking through the process, students are continually practicing articulating their skills and developing a repertoire of topics that can be discussed in an interview, as well as raising their self-efficacy and peer-efficacy (Goddard, Hoy, & Woolfolk Hoy, 2004) through giving and receiving positive feedback with peers. Students then write up their experience and collect a piece of evidence to support their story. Although the gradCAP bears similarities in different courses, the tasks are contextualised to the needs of the discipline. In Speech Pathology, students are asked to draw out their CBOS and COMPASS professional competencies using Peet's Hidden Moment techniques (2013) (Figure 1), while in Engineering, students consider Course Learning Outcomes using Episodes and Elevator Pitches, which aligns with their current practice.

The gradCAP is the central location where the embodied questions and reflective processes are housed, where the students add their story and upload their evidence. By doing this, students will have collated multiple stories and pieces of evidence they can draw from when creating their showcase portfolio in their final year.

Built into the gradCAP are opportunities for Career Advisors to work with directly with students. Particularly relevant are an About Me page for first year students, where students consider their presentation as a professional, the Contact Me page for second year students, where students look at their professional presence in social media and a Career Development page, for final year students, where students consider their networking opportunities.

The screenshot shows a web interface for an ePortfolio. At the top, there is a dark navigation bar with three tabs: 'Requirements', 'Competencies', and 'About Me'. The 'Competencies' tab is selected, and a dropdown menu is open, showing a list of competencies: 'Back', 'COMPASS', 'Reasoning', 'Communication', 'Learning', and 'Professionalism'. Below the navigation bar, the main content area is titled 'Hidden Moment' and includes a sub-header 'Use this table to quickly note down what happened'. The content is organized into a table with six columns, each representing a task: 1. Overview: Why were you there? What were you aiming to do?; 2. Decision: What decision did you make? What skills did you use?; 4. Light-bulb moment: What suddenly became very clear to you?; 5. Lessons learned: What impact did this experience have on you or others?; 6. Application: What two ways can you apply what you learned to other areas of your life? Each task has a corresponding input field for the user to write their response.

Figure 1: Hidden Moment tasks are used in Speech Pathology to draw out professional competencies.

While Edith Cowan University is currently trialling the gradCAP workbook with first year students, the system is designed with a final year showcase portfolio in mind. The 'About Me' and 'Contact Us' pages that are to be completed during the course should be updated and included in the portfolio (Figure 2). In third year, students are expected to have more knowledge of their profession and their own skills and achievements. As a result, in third year, they can review the stories they have previously written, select those that represent their key skills, and organise their portfolios in a way that demonstrates their unique abilities. We suggest a page for each of the three types of Course Learning Outcomes: Knowledge, Skills and Application. We are naming these 'My Knowledge', 'My Skills' and 'My Showcase' (Figure 2). However, students will be encouraged to take their own approach on this in order to differentiate themselves from others. Students will be encouraged to use these portfolios to apply for work. However, the ultimate aim is that by going through the process of articulating their knowledge, skills and achievements verbally throughout their course and in writing, and by creating the portfolio, students will better understand their capabilities and be confident in representing these to others.

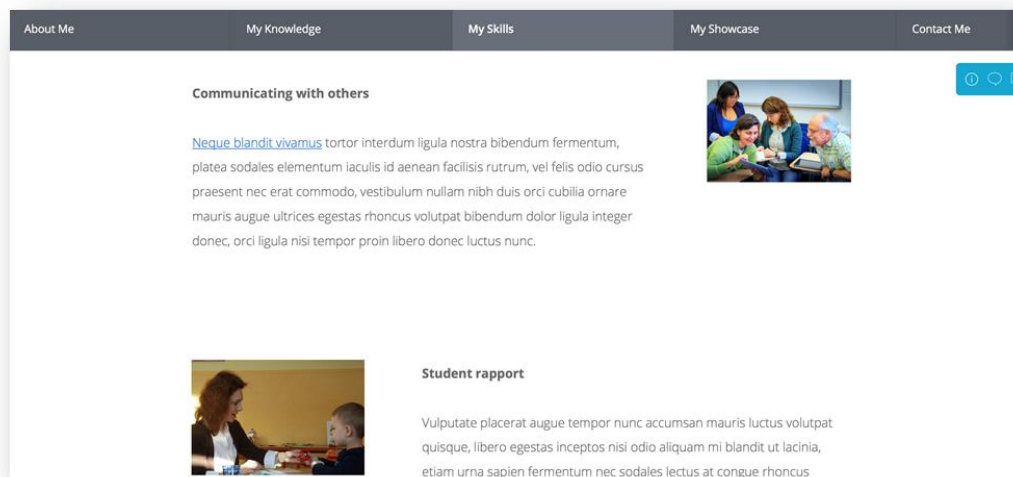


Figure 3: Sample showcase portfolio, drawing together stories that demonstrate knowledge, skills and achievements.

Students and academic staff members from different courses will be invited to attend focus group sessions at the end of the current semester to evaluate the effectiveness of model and to inform future adaptations of the model. Next year, surveys will be given to students at the beginning and end of semester to examine whether students' confidence changes over the semester. This will be repeated for both semesters and continued into future years, to examine changes in confidence over time. Data gathered through this approach should also show whether there are differences between students in different courses, and between different groups of students, including male and female students, and international students and domestic students.

Conclusion

The gradCAP approach is designed to support students to become articulate and confident graduates who recognise their own knowledge, skills and achievements. Through integrative learning techniques, students will be given multiple opportunities to articulate their experiences from a professional perspective. Using stories they have written and evidence they have collated throughout their course, students will be guided to produce showcase portfolios where their abilities can be meaningfully and uniquely demonstrated. The aim of this process is to support students as they become confident graduates and beyond, aware of what they bring their future profession. Future work will be done on evaluating the process of the approach in terms of changes in confidence levels among students and different experiences for different cohorts of students.

References

- Australian Government. (2002). *Employability skills for the future*. Retrieved from <http://www.voced.edu.au/content/ngv%3A12484>
- Becker, G. S. (1975). *Human capital: A theoretical and empirical analysis with special reference to education*. New York, NY: National Bureau of Economic Research. Retrieved from <http://www.nber.org/chapters/c3730.pdf>
- Cranmer, S. (2006). Enhancing graduate employability: Best intentions and mixed outcomes. *Studies in Higher Education*, 31(2), 169–184. doi:10.1080/03075070600572041
- Crebert, G., Bates, M., Bell, B., Patrick, C., & Cragolini, V. (2004). Developing generic skills at university, during work placement and in employment: graduates' perceptions. *Higher Education Research & Development*, 23(2), 147–165. doi:10.1080/0729436042000206636
- Department of Industry, Innovation Climate Change, Science, Research (DIICCS RTE), & Department of Education, Employment and Workplace Relations (DEEWR). (2013). *Core skills for work developmental framework*. Retrieved from <https://cica.org.au/wp-content/uploads/Core-Skills-for-Work-Developmental-Framework-2013.pdf>
- Edith Cowan University. (2015). *Graduate employment framework*. Joondalup, WA: Author.
- Goddard, R. D., Hoy, W. K., & Woolfolk Hoy, A. (2004). Collective efficacy beliefs: Theoretical developments, empirical evidence, and future directions. *Educational Researcher*, 33(3), 3–13. doi:10.3102/0013189X033003003
- Graduate Careers. (2015). *GradStats*. Retrieved from http://www.graduatecareers.com.au/wp-content/uploads/2015/12/GCA_GradStats_2015_FINAL.pdf
- Huber, M. T., & Hutchings, P. (2004). *Integrative learning: Mapping the terrain*. Washington, DC: The Carnegie Foundation for the Advancement of Teaching and the Association of American Colleges and Universities.
- Lowden, K., Hall, S., Elliot, D., & Lewin, J. (2011). *Employers' perceptions of the employability skills of new graduates*. London, UK: Edge Foundation.
- Mason, G., Williams, G., Cranmer, S., & Guile, D. (2003). *How much does higher education enhance the employability of graduates?* Higher Education Funding Council for England (HEFCE). Retrieved from <http://eprints.ioe.ac.uk/3977/>
- Mayer, E. (1992). *Key competencies*. Retrieved from <http://www.voced.edu.au/content/ngv%3A2805>
- National Committee of Inquiry into Higher Education. (1997). *The Dearing report (1997): Higher education in the learning society: Main report*. Education in England: The history of our schools. Retrieved from <http://www.educationengland.org.uk/documents/dearing1997/dearing1997.html>

- Nilson, L. B. (2013). *Creating self-regulated learners: Strategies to strengthen students' self-awareness and learning skills*. Sterling, VA: Stylus.
- Peet, M., Lonn, S., Gurin, P., Boyer, K. P., Matney, M., Marra, T., ... Daley, A. (2011). Fostering integrative knowledge through ePortfolios. *International Journal of ePortfolio*, 1(1), 11–31.
- Planning, Quality and Equity Services Centre. (2016, March 30). *Report graduate employment: GDS results 2012–2015*. Joondalup, WA: Edith Cowan University.
- Schneider, C. (2004). Practicing liberal education: Formative themes in the reinvention of liberal learning. *Liberal Education*, 90(2), 6–11.
- Yorke, M., & Knight, P. T. (2004). *Embedding employability into the curriculum*. York, UK: Higher Education Academy.

Biography

Heather Pate

Heather Pate is a Senior Learning Designer in the Centre for Learning and Teaching at Edith Cowan University. Since arriving at the university in 2012, Heather has supported a wide range of academic staff members integrate ePortfolios into their units and courses. Previous to this, Heather was the Head English Teacher at the International Pathways Program, Wuxi South Ocean College, China, from 2002. She is particularly interested in how ePortfolios can be used to scaffold student learning and how all students can be supported throughout their courses and into their future careers.

Developing professional identity through self-reflection using an ePortfolio app

Ruth Sibson

Edith Cowan University

Linda Riebe

Edith Cowan University

Abstract

The ePortfolio is increasingly being utilised in Higher Education as a tool for learning, reflection and the development of one's self, as well as a means to develop and showcase an individual's overall professional identity to employers. However, ePortfolio use within business undergraduate education is relatively new. This paper draws on both educator reflections and the findings of an online survey of students studying a core, second year, professional development business unit to examine the relevance of written, structured and oral, video reflection ePortfolio assessment item tasks. Tasks focused on the evaluation of personal practices (in the behaviours of either emotional intelligence or stress management) in the development and showcase of professional identity. The paper also explores educator and student views of the appropriateness and use of an ePortfolio, and more specifically that of the PebblePad platform and its new Pebble Pocket app (PP app). Overall, the findings from the survey indicate that the assessment item was successful as it provided an authentic learning experience, seen as relevant to professional identity development by those students with little workplace experience, but less relevant to others with more than five years professional workplace experience. Students indicated that the use of the structured reflection template was extremely helpful to keep them on track with ordering their thoughts for the oral video reflection task. Many students indicated that they had no issue using the PP app, and although a number of technical issues surfaced during the semester and 'work arounds' were devised at the time, these were highlighted as problematic by some. The responses from students in this study on the use of both the ePortfolio software and the video reflection as a tool for career management were identified as both positive and negative. It is likely that future use depends upon how much the individual values and/or is able to manage new technologies, along with its functionality and applicability to the task at hand and its potential for future recruitment purposes. From an educator perspective, every student's oral video reflection was considered insightful as it demonstrated students' growing self-awareness of their individual professional identity formation, and delivered benefits in terms of reduction of workload, and therefore, prompt return of feedback to students.

Keywords: *self-reflection, ePortfolio app, professional identity, business undergraduate students*

Introduction and background

Driven by a range of factors, including the desire to incorporate reflective practice, the development of career portfolios, the documentation of professional standards and/or degree outcomes, as well as learner and identity development, interest in, and use of, ePortfolios in Australian Higher Education (HE) is growing. The ePortfolio provides students with a useful and flexible tool with which to demonstrate knowledge, skills, abilities and values both in HE and professional contexts (Bennett, Rowley, Dunbar-Hall, Hitchcock, & Blom, 2016). Further, an ePortfolio can assist in facilitating the student learning journey across a degree as it can be used as a vehicle through which one's professional identity is developed, negotiated and constructed; and can prompt students to adopt future-oriented thinking in terms of a graduate professional identity if learning is redefined in relation to their future lives and careers (Bennett et al., 2016). Through the use of ePortfolios, students begin to assemble evidence of application of knowledge and make sense of practice (Trede, Macklin, & Bridges, 2012), which may contribute to the development of professional identity. Moreover, although it is still debatable as to whether employers are open to receiving online ePortfolios (Leece, 2005), the increased use of online sites and application forms, and a more 'general acceptance' of the use of video submissions for job applications (Burgess, 2016), indicate that new technologies are increasingly being used for recruitment purposes across a range of industries.

Professional identity, in this study, is defined as the development of the knowledge, skills and ways of being and values, associated with a chosen profession (Trede et al., 2012). Reflective praxis on knowledge, skills, personal attributes and values within an ePortfolio can provide a valuable opportunity for students to develop metacognition through which they can interpret their experiences (Lizzio & Wilson, 2007) and, over time, re-interpret and update their professional identity through "imagining and preparing for a professional career" (Rowley & Munday, 2014, p. 81). Therefore, gaining a sense of self through determining and reflecting on personal strengths and weaknesses, imagining and visualising future implications of learning will assist students in the construction of professional identity (Jackson, 2016). For example, learning about and reflecting on emotional intelligence strengths and/or weaknesses can assist students to prepare for social interactions in the workplace (Zeidner, Matthews, & Roberts, 2004). Learning about and reflecting on stress management issues can prompt students to engage with stress reduction techniques (Houghton, Wu, Godwin, Neck, & Manz, 2012), thereby enhancing cognition of usability of techniques in their chosen profession.

This paper draws on both educator reflections and the findings of an online survey of second year HE business students in a professional development unit to examine the relevance of four key tasks associated with an ePortfolio reflection assessment item in the development and showcase of professional identity. In the first task, students were assigned readings on two behaviours — emotional intelligence (EI) and stress management — and then chose one to complete self-assessment tasks. For EI, students had to complete a test scored under four headings: emotional awareness, control, diagnosis, and response. High scores indicated strength, with low scores indicating an area requiring attention. Students were then required to reflect on their

score under each heading and give examples of how they could improve on weaknesses and/or incorporate strengths in the future. For stress management, students had to trial five temporary stress reduction techniques: deep breathing; muscle relaxation; guided imagery; rehearsal; and, reframing (positive self-talk), at home. They then had to reflect on what worked for them and why, and give examples of how they would use these techniques in the future. The deep breathing technique was taught and practiced in class, with examples of other techniques provided through the textbook and video clips. The third and fourth tasks required the use of the Pebble Pocket application (PP app) where students were asked to write a structured reflection on their chosen behaviour and then, using this as a guide, to provide a final, video asset reflection of approximately two-minutes in length, shared for assessment through their PebblePad ePortfolio.

The PP app was introduced by PebblePad™ in 2016 and can be downloaded for both Apple and Android devices. Downloading and logging in with the PP app allows the app access to internet connection, pictures/media/files as well as the camera and microphone on the mobile device. Information on the PebblePad (n.d.) website informs us that PebblePocket can be used to:

- Create simple records of your learning using post, reflection or activity templates
- Add photos or videos
- Save, edit or remove your mobile assets on the device
- Send assets to your Pebble+ asset store
- Link to the your PebblePad account so you can also use the app to launch PebblePad in a device browser.

Given the proclivity of most students to have access to a smart phone and an understanding of how to download and use online application technology, introducing the PP app was considered one way to implement an innovative approach to the use of information and communication technology (ICT) in the classroom. To assist students, lecturers designed step by step instructions in a written guide. A learning designer also designed a video clip offering best practice tips for oral recordings.

Methods

In the final week of semester one 2016, all on-campus students enrolled in the second year business unit were invited to complete an anonymous, online survey administered through the Qualtrics software platform. The research received approval from, and followed the ethical guidelines of, the University's Human Research Ethics Committee.

There were three sections in the survey which contained a mixture of closed and open-ended questions. The first section asked participants basic demographic information. The second section provided the study's definition of professional identity development and asked students to nominate the business discipline that best described the profession in which they would be seeking graduate employment. Next, participants were asked to rate the relevance of the tasks associated with completing the ePortfolio reflection assessment item in the development of their professional identity (on five-point Likert, slider, scale measures); and finally, in an

open-ended question, to provide comment on the selections made. The third section focused on the students' previous, current and potential future use of PebblePad.

Quantitative data in the form of descriptive statistics including frequencies, percentages, and means were provided in a report through the Qualtrics software, and the raw data was exported into Excel for manual checking and further analysis. The raw data from the open-ended questions were analysed using a general inductive approach where specific themes were developed through detailed readings of these textual responses (Thomas, 2006). These themes captured the core messages reported by the student participants and are discussed further in the results section below. The themes were evaluated by both researchers to ensure consistency of judgement about the key messages; and appropriate quotations were used to convey the essence of these themes.

Results

Student characteristics

There were 150 students enrolled in an on-campus mode of the core business unit, and a total of 26 students completed the online survey; which represented a response rate of 17%. Table 1 below shows the demographics and characteristics of the student sample.

Table 1: Demographics and characteristics of student sample.

Student sample (N = 26)	%
Gender	
Male	35%
Female	65%
Enrolled as	
Domestic student	81%
International student	19%
No. of units studied this semester	
1–2 units (part-time)	12%
3–5 units (full-time)	88%
Years in paid employment	
Never worked in paid employment	8%
1 to 4 years	27%
5 to 8 years	35%
9 to 12 years	19%
More than 12 years	12%
Profession in which you will be seeking graduate employment	
Accounting	46%
Marketing	19%
Event Management	8%
Finance	8%
Human Resource Management	8%
Other (e.g. International Business, Project Management, Tourism/ Hotel Management)	11%

Relevance of assessment tasks to development of professional identity

For the ePortfolio reflection assessment item, students had a choice of one of two behaviours: 69% of students chose stress management and 31% of students chose emotional intelligence (EI). Students were then asked to rate the relevance (on five-point Likert slider-scale measures, where 1 = not at all relevant and 5 = extremely relevant) of each of the four key tasks associated with completing the assessment item in the development of their professional identity. The quantitative results in Table 2 allow for statistical ranking, through comparison of mean scores, of the relevance of each task.

Table 2: Responses to relevance of task to development of professional identity.

Task	Mean	SD	n
Self-assessments (e.g. Self-awareness, LETS, EI)	3.69	1.09	26
Oral, video reflection in Pebble Pocket/Pad	3.40	1.29	26
Unit/textbook readings (e.g. Stress Reduction, EI)	3.15	1.08	26
Written, structured reflection in Pebble Pocket/Pad	3.12	1.14	25

Analysis of the open-ended question responses on the relevance of these tasks in the development of their professional identity revealed mixed reactions. Approximately half of the responses were positive in that students could elaborate on their relevance and half of respondents indicated that they could not see how it was relevant to them and their future. The key theme from the positive responses, for the EI behaviour, were related to improved self-awareness of strengths and weaknesses. As one student elaborated:

I found the self-assessment and video reflection to be crucial, as knowing your strengths and weaknesses is an advantage when stepping into the workforce.

For those focused on stress management, awareness in identifying and using the specific techniques that could be used now and in the future were important:

Completing the stress management techniques were very helpful as trying to juggle university, work and social lives is quite a challenge, and stress is definitely a big problem with students. I was able to identify techniques that really worked for me and that I will likely continue to use into my professional career.

Further, some students also identified that the use of technology and/or software was relevant in the development and management of their career:

I do think that things are changing and a person can showcase himself/herself to an employer through PebblePad.

The negative responses from students indicated that they could not see how the tasks of reflective writing and/or a video presentation assisted them because of their previous life and/or work experiences:

I am already aware of my emotional intelligence and how to deal with stress. At this stage in my life I did not benefit much from these tasks.

It was an interesting assignment and enjoyable to complete however I don't think it helped support my professional identity a lot. However, for people who have never used video conferencing or seen themselves on camera, this would have helped them a great deal.

In the final question on the survey, students were asked whether they would ever use PebblePad to showcase themselves to an employer in the future: 27% of students indicated "probably yes" (23%) or "definitely yes" (4%), with 23% "unsure" and 31% "probably not" and 19% "definitely not".

Student perceptions of using PebblePocket/Pad

As this was a second year unit that followed on from a core first year unit which introduced students to PebblePad and a career ePortfolio, 96% of students indicated they had previously used PebblePad. However, as noted, this was the first semester the Pebble Pocket app had been used. Data from the open-ended question which asked about students' perceptions on the ease of use and appropriateness of Pebble Pocket/Pad for these tasks again elicited both positive and negative responses. Comments included:

"The app was pretty easy to use" and "a few technical issues with PebblePocket, nothing major"

Don't make me use PebblePad again, it's buggy and not intuitive

It was nightmare to use as it was always crashing, confusing to operate and very muddled form start to finish. Then to top it all off it was not able to cope with the length of the videos we had to submit.

Some students also indicated that the issues they had with the PP app meant that they just used PebblePad instead:

I found no use from Pebble Pocket as I filmed my video on my computer which had better lighting and stability than my phone did. It was just as easy to upload with no issues from my computer and I was able to use the full 2 minutes allowed.

Others made specific suggestions on how to improve its functionality:

The app seems to be made very recently as it feels very "beta" but that is to be expected when an app is newly launched. It doesn't have a smooth flow and I believe the operating system can be designed a bit better so users can get around more simply

Would be great if Pebble Pocket had the function to submit the video for the assignment. Seemed like double handling to then have to go into Pebble to share for assessment.

A number of students made positive comments on the usefulness of the structured reflection template in Pebble Pocket/Pad to both the written and oral reflection tasks:

I used the written section as a guide/script for my reflection which was useful when I needed to be reminded of what to discuss next.

Discussion and conclusions

Although it was a low response rate, the survey provided some interesting results. The findings are briefly discussed here in relation to the views and experiences of these particular respondents, as well as through a reflection of the educator responsible for teaching and coordinating the unit. Overall, there were a number of respondents who did indicate that the ePortfolio reflection assessment item tasks were relevant to the nascent development of their professional identity. The tasks assisted in improved self-awareness in relation to strengths and weaknesses of their EI or the identification and use of relevant, stress reduction techniques. On the other hand, there were respondents who indicated that the assessment item tasks were not relevant or did not assist them because of their stage in life and/or previous workplace experiences. The second year unit is considered a professional development unit and, although it is a core unit in the Bachelor of Business, students can apply for recognition of prior learning if they have relevant workplace experience. However, Accounting students must complete the unit for accreditation purposes. In this survey, 46% of respondents stated Accounting as their major. A further filter of the open-ended responses revealed that negative comments were generally from those who had 5+ years of work history and were aged 23 and over. Two issues are therefore immediately highlighted in these findings. First, the unit cohort is more difficult to cater for due to the broad demographics (e.g. respondent ages ranged from 19 to 56). Second, the findings indicate that while the assessment item is 'working' by providing an authentic learning experience, it is mainly seen as relevant to students who have little workplace experience; it appears less relevant to those who already have professional workplace experience. Therefore, some changes are required to the assessment item so that it might cross these divisions more readily.

The use of the PebblePad ePortfolio platform is currently not mandated at the university, but it is a highly recommended tool. It has been deployed in this second year business unit since 2014 to aid in reflective practice, and also the collection of career portfolio evidence. Student feedback has always been divided and, the introduction of the PP app has also elicited both positive and negative critique. Many students indicated they had no issues using the PP app and that they found the use of the structured reflection template to be extremely helpful to keep them on track with ordering their thoughts. There were, however, a number of technical issues which surfaced during the semester with its use which were highlighted in the survey responses. Although students did not report any difficulties downloading the PP app to a mobile device, issues were encountered in sending a completed video from a mobile device through to their PebblePad account due to the length of the recording, file size and Internet speed. These issues were raised by students with the unit coordinator at the time and 'work arounds' were devised including: connecting via 4G, limiting the video to under two minutes and/or using a compression app to compress the file size. Given this was the first time using the PP app, flexibility in mode of recording was allowed, which enabled these hurdles to be addressed. Now that these issues have been identified, they can also be addressed prior to next iteration of the unit.

In providing a comment from an educator perspective, and notwithstanding the technical issues encountered, the oral video reflection task was considered a successful element of the unit. Reflective praxis has always been required in this unit and its importance in developing professional identity is emphasised by educators throughout the semester, and given further academic credence through both formative and summative assessments. While initial instruction, guidance and practice in the use of written and oral structured reflections is an additional time cost to educators associated with implementing this pedagogy (both outside and inside the classroom), the experience has delivered positive outcomes for many students and the educators in the unit. Providing a rubric with detailed criteria based on the structured reflection template in the PP app provided students with a transparent set of parameters on which to base their oral, video reflection. Although there was a time limit on the length of the video, the majority of students had obviously put a great deal of effort into first writing their structured reflection using the template — which they did not have to submit — and rehearsing their oral presentation of the reflection prior to recording. Every student's video reflection was considered insightful because they addressed the content differently (as related to their own individual professional identity formation), and demonstrated their growing self-awareness. For educators, using the criteria to evaluate the reflections was a beneficial aid to marking as there were clear parameters which had to be addressed by students — particularly strengths, weaknesses and future application of the behaviour. Listening to the two-minute oral reflections enabled educators to gauge each student's understanding of the content against the criteria quite quickly, thereby reducing marking load of a large cohort considerably. Whilst the latter is not the most important outcome, given marking turnaround constraints for educators, it was an outcome found to be advantageous. Students also appreciated prompt return of grades and feedback on their professional identity development through reflective practice and the innovative use of new technology.

The responses from students in this study on the use of both Pebble Pad/Pocket and the video reflection as a tool for career management were identified as both positive and negative. Although 27% of students said they would probably or definitely use PebblePad to showcase themselves to an employer, 50% indicated they would probably not, or definitely not do so. As this study comprises a small sample, it is difficult to draw further conclusions from this data; however, we posit some possible reasons for this low rate of support. First, the negative aggregated result of 50% of students who would not/probably not use PebblePad to showcase themselves to employers has implications that may derive from the ePortfolio's relevance to certain demographics, and/or technical difficulties encountered with the software that may have lessened student interest. It is also possible that the response could be due to the relatively recent introduction of the ePortfolio platform to some students. Second, implementing the ePortfolio technology resulted in an additional time cost to educators in the development of resources and, the restructuring of the unit to include the space required to support student fluency with the technology. The subsequent impact is that in structuring in time to teach students how to use ePortfolios, less time was available to focus on an exploration of the importance to future employment use. Third, although the use of online recruitment sites by employers has increased in recent years, and there is a more 'general acceptance' of

the use of video submissions for jobs across a range of industries (Burgess, 2016), it is also possible that students have a perception that employers are still not open to receiving online ePortfolios (Leece, 2005). These are all important considerations in the future use of ePortfolios in HE and beyond.

Future research would benefit from a larger sample size of students, and a longitudinal approach combining other methods of data collection, such as focus groups and/or interviews. It would also be beneficial if these issues were explored in more detail with educators, managers and/or human resource professionals across a range of disciplines or industries.

References

- Bennett, J., Rowley, J., Dunbar-Hall, P., Hitchcock, M., & Blom, D. (2016). Electronic portfolios and learner identity: An e-Portfolio case study in music and writing. *Journal of Further and Higher Education*, 40(1), 107–124. doi:10.1080/0309877X.2014.895306
- Burgess, M. (2016, February 16). *Recruiters opt for CV alternatives to avoid filtering out young job seekers*. News Corp Australia Network. Retrieved from: www.news.com.au
- Houghton, J., Wu, J., Godwin, J., Neck, C., & Manz, C. (2012). Effective stress management: A model of emotional intelligence, self-leadership, and student stress coping. *Journal of Management Education*, 36(2), 220–238. doi:10.1177/1052562911430205
- Jackson, D. (2016). Reconceptualising graduate employability: The importance of pre-professional identity. *Higher Education Research & Development*, 1–15. doi:10.1080/07294360.2016.1139551
- Leece, R. (2005). The role of e-portfolios in graduate recruitment. *Australian Journal of Career Development*, 14(2), 72–78. doi:10.1177/103841620501400211
- Lizzio, A., & Wilson, K. (2007). Developing critical professional judgement: The efficacy of a self-managed reflective process. *Studies in Continuing Education*, 29(3), 277–293. doi:10.1080/01580370701419189
- PebblePad. (n.d.). *Pebble+ help: PebblePocket*. Retrieved from <http://www.pebblepad.co.uk/pp3help/helpfile.aspx?t=1&vn=9.0&v=10&tg=3bf540bf-f5a7-4714-a00e-bca93111676b&f=193&v3k=d2a5149c-1595-4e4e-a02a-494a9f52d7c5>
- Rowley, J., & Munday, J. (2014). A ‘sense of self’ through reflective thinking in ePortfolios. *International Journal of Humanities Social Sciences and Education*, 1(7), 78–85.
- Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, 27(4), 237–246. doi:10.1177/1098214005283748
- Trede, F., Macklin, R., & Bridges, D. (2012). Professional identity development: A review of the higher education literature. *Studies in Higher Education*, 37(3), 365–384. doi:10.1080/03075079.2010.521237

Zeidner, M., Matthews, G., & Roberts, R. (2004). Emotional intelligence in the workplace: A critical review. *Applied Psychology: An International Review*, 53(3), 371–399. doi:10.1111/j.1464-0597.2004.00176.x

Biography

Ruth Sibson

Ruth Sibson is a Senior Lecturer within the School of Business and Law at Edith Cowan University (ECU) in Perth, Western Australia. Dr Sibson currently coordinates the Sport, Recreation and Event Management Program and for the past six years has coordinated the Bachelor of Business. Her current teaching and research interests include integrating and examining the use of ePortfolios to manage and showcase student learning across both degrees, including the development of graduate professional identities. In 2011, Ruth won the Vice Chancellor's Award for Engagement in Teaching & Learning for her role in assisting students and graduates in their transition to the workplace, and in 2013 she was awarded the Academic Staff Award for the Best Practice ePortfolio at ECU for her design and use of ePortfolios for enhanced employability outcomes.

Evaluating the use of a career ePortfolio in the development of business students' professional identities

Ruth Sibson

Edith Cowan University

Dean Roepen

Edith Cowan University

Abstract

The relationship between ePortfolios and the development of professional identities and graduate employability is of growing interest in Higher Education. This paper presents the findings from a research project which used online surveys to examine first year, undergraduate business student views of the relevance of a career ePortfolio assessment item to develop, reflect upon and showcase the employability skills core to their unit and its role in the development of their professional identity. It also explores students' experiences of creating an ePortfolio, focussing on the ease of use and appropriateness of both the Pebble Pad platform and customised teaching and learning resources. Overall the findings indicate that if the assessment item and teaching and learning resources are structured appropriately then ePortfolios can be a place where career management skills and professional identity formation can begin to develop. In completing the requirements of nine folio pages, students made comments that it assisted in the development of an understanding of their strengths and weaknesses in relation to employability skills; the reflective practice requirement assisted in the development of the specific skill of self-awareness; and, they were able to develop their career management skills. To assist these students in the creation of their ePortfolios, the majority of whom are using the software for the first time, the unit coordinator has developed a range of teaching and learning resources. Of these resources, students identified the most useful to be the "hands-on" activities undertaken in class with the lecturer and the instructional guide. Students also made positive comments in regards the suitability of the software itself in that it was easy to use, appropriate and professional, and it allowed for the organisation and structuring of ideas/work. There were some negative responses about technical issues and understanding how to use the software, but these were quite limited; some students made suggestions on how the software could be improved in terms of functionality. When asked whether they would use an ePortfolio to showcase themselves to an employer in the future, many students responded positively in that they would definitely, or probably, do so. Importantly, although this is a small-scale study, these findings show a willingness and an interest by this cohort to further engage with digital identity formation and representation and should be of interest to all educators seeking to develop the professional identity of their students.

Keywords: *career management, ePortfolio, professional identity, business undergraduate students*

Introduction and background

The changing profile of university entrants and the workplace has led to a greater emphasis on graduate employability and interest in how to facilitate this (Bridgstock, 2009; Daniels & Brooker, 2014). The importance of professional identity to graduate employability across the Higher Education (HE) sector is also increasingly being acknowledged. The recent literature on professional identity formation moves beyond the understanding that developing a set of non-technical skills, alongside a set of technical skills and knowledge required by a profession, is all that is required for graduate employability — and includes opportunities and authentic experiences that provide for learning, reflection and the development of one's self and career through engagement with a range of relevant work, university and community based entities and individuals (Bridgstock, 2009; Daniels & Brooker, 2014; Jackson, 2016). Career management skills, and ensuring that graduates are able to independently and proactively manage and navigate the world of work for lifelong learning is also increasingly acknowledged as important (Bridgstock, 2009). The ePortfolio provides students with a useful and flexible tool with which to demonstrate knowledge, skills, abilities and values both in HE and professional contexts (Bennett, Rowley, Dunbar-Hall, Hitchcock, & Blom, 2016). Further, an ePortfolio can prompt students to adopt future-oriented thinking in terms of a graduate professional identity if learning is redefined in relation to their future lives and careers (Bennett et al., 2016). Professional identity, in this study, is defined as the development of the knowledge, skills and ways of being and values, associated with a chosen profession (Trede, Macklin, & Bridges, 2012).

This paper examines the views of first year business students on the relevance of a career ePortfolio assessment item to develop, reflect upon and showcase the employability skills core to their unit (e.g. communicating effectively, analysing data and using technology and self-awareness), and its role in the development of their professional identity. It also explores their experiences of creating an ePortfolio, focussing on the ease of use and appropriateness of both the Pebble Pad platform and customised teaching and learning resources. For the assessment item, students were required to create an ePortfolio (3500-word length) which included nine folio pages: one Introduction page including a short personal biography; six pages each addressing a nominated employability skill behaviour using the STAR (situation, task, action, result) approach; one written structured reflection on their personality type; and a final page outlining career management activities and career plans with evidence. Students were advised to use the What/So What/What Next? Approach in the final two pages. Throughout the semester, students were provided with multiple forms of support to assist them with the creation of their ePortfolios. This support included a series of activities completed in class; a series of "bolt-on" workshops run external to the unit; and, a variety of multi-modal resources which were made available to students through the unit's Learning Management System (LMS).

Methods

In the final week of semester one 2016, all on-campus students enrolled in the first year business unit were invited to complete an anonymous, online survey administered through the Qualtrics software platform. The use of an online survey allowed for systematic collection and automated input of both quantifiable and qualitative data. The research received approval from, and followed the ethical guidelines, of the University's Human Research Ethics Committee. All students received an information letter explaining the purpose of the research, and that participation was voluntary.

There were three sections in the survey which contained a mixture of closed and open-ended questions. The first section asked participants basic demographic information, including questions on their student and employment status. The second section provided the study's definition of professional identity development and asked students to nominate the business discipline which best described the profession in which they would be seeking graduate employment. They were then asked to rate the relevance (on five-point Likert, slider, scale measures) of each task associated with completing the ePortfolio assessment item in the development of their professional identity and finally, in an open-ended question, to provide comment on the selections made. The third section focused on their previous, current and potential future use of Pebble Pad, including questions on its ease of use and appropriateness for the assessment item and usefulness of the associated resources for learning how to use the software, and whether they would use Pebble Pad to showcase themselves to an employer in the future.

Quantitative data in the form of descriptive statistics including frequencies, percentages, and means were provided in a report through the Qualtrics software, and the raw data was exported into Excel for manual checking and further analysis. Data from the open-ended questions was analysed using a general inductive approach to identify themes from the textual responses (Thomas, 2006). In doing so, a close reading of the responses was undertaken and themes were developed and refined so that, in the view of both researchers, they characterised the key messages of the students; and appropriate quotations were used to convey the essence of these themes.

Results

Student characteristics

There were 273 students enrolled in an on-campus mode of the core business unit, and a total of 50 students completed the online survey; which represented a response rate of 18%. There were twice as many females (68%) than males (32%); the average age was 23 (23.32) years and 58% were enrolled as domestic students with 42% as international students. The majority of students were studying full-time (86%) and the average number of hours currently worked per week in paid employment was 16.1 hours (with a range of 0 to 48 hours). Table 1 below shows further information on the demographics and characteristics of the student sample.

Table 1: Demographics and characteristics of student sample.

Characteristics	%
Gender (n = 50)	
Male	32%
Female	68%
Enrolled as a... (n = 50)	
Domestic student	58%
International student	42%
No. of units studied this semester (n = 50)	
1–2 units (part-time)	14%
3–5 units (full-time)	86%
How many years have you been working in paid employment (n = 50)	
I have never worked in paid employment	20%
1 to 4 years	48%
5 to 8 years	14%
9 to 12 years	8%
More than 12 years	10%
Which discipline best describes the profession in which you will be seeking graduate employment? (n = 50)	
Accounting	40%
Human Resource Management	12%
Management	10%
Event Management	8%
Tourism/Hospitality/Hotel Management	8%
Other (e.g. Marketing, Planning, Project Management, Sport Management)	22%

Relevance of Career ePortfolio assessment item tasks in the development of professional identity

Students were asked to rate the relevance (on five-point Likert slider-scale measures, where 1 = not at all relevant and 5 = extremely relevant) of each of the four key tasks associated with completing their Career ePortfolio assessment item in the development of their professional identity. The quantitative results in Table 2 below allow for statistical ranking, through comparison of mean scores, of the relevance of each task.

Table 2: Responses to relevance of task in the development of professional identity.

Item	Mean	SD
Addressing 6 employability skill behaviours using the STAR approach with evidence	4.10	0.90
Introduction folio page: short personal biography	4.00	1.05
Outline of career management activities and career plans	3.98	0.91
Writing structured reflection on personality type	3.74	1.03

There were 24 responses to the open-ended question where students were asked to comment on the relevance of these career ePortfolio assessment tasks in the development of their professional identity. Analysis revealed three main themes in which the students spoke of relevance: the development of an understanding of their strengths and weaknesses in relation to employability skills; the development of self-awareness through reflective practices; and, the development of career management skills. Table 3 provides examples of some of student responses for each of these themes. Only one respondent provided a 'non-positive' response in regards relevance by stating: "I think it depends entirely on the career you are going into and the requirements of the job".

Table 3: Themes which emerged from analysis of the open-ended questions pertaining to the relevance of using a career ePortfolio in the development of professional identity.

The development of an understanding of their strengths and weaknesses in relation to employability skills
<p><i>"It helps to find your own skills as makes you think about the skills that you have and don't have."</i></p> <p><i>"We have gained in-depth knowledge about ourselves. We have also seen the loopholes (sic) within ourselves, which are holding us back in terms of performing well in the field."</i></p> <p><i>"The STAR analysis of the employability skills like communicating effectively, using technology and information management were quite useful in assessing our own skills gained through experience as well as academically."</i></p>
The development of self-awareness through reflective practices
<p><i>"Discovering my personality type made me rethink the type of person I am and has dramatically benefited me in my daily life. Reflecting on this will also help me learn to approach certain aspects in a workforce environment correctly."</i></p> <p><i>"Having a section on my personality type. I have more self-awareness. This actually helps me to know myself."</i></p> <p><i>"It allows me to discover my personality more and to develop my professional identity by refining my skills and attributes."</i></p>
The development of career management skills
<p><i>"The outline and career management plans page show what I plan to do about my strengths and weaknesses and how to go about gaining more experience."</i></p> <p><i>"The reflection of the personality type page will help decide what roles and tasks will suit me best and where I am most likely to thrive."</i></p> <p><i>"Lastly, to have outlined my career plans. I have try to discover what path I really want to work in my future."</i></p>

As one of the final questions on the survey, students were also asked whether they would ever use PebblePad to showcase themselves to an employer in the future. 72% of students indicated "probably yes" (48%) or "definitely yes" (24%), with 20% "unsure" and 8% "probably not".

The perceptions of students regarding the ease of use and appropriateness of using the PebblePad software platform to create a career ePortfolio

As this was a first year unit, 90% of students indicated they had not previously used Pebble Pad. A number of resources were developed by the unit coordinator and the usefulness of these were rated by students (see Table 4 below)

Table 4: Student ratings on the usefulness of resources for learning how to use Pebble Pad.

Item	Mean	SD	n
Learning "hands-on" in class (from the lecturer)	4.15	0.84	46
Instructional guide (with screenshots)	3.98	1.11	46
Instructional video	3.83	1.05	41
Learning "hands-on" in class (from other students)	3.33	1.07	40

Data from the open-ended question which asked about students' perceptions on the suitability of PebblePad as a platform for creating their career ePortfolios were classified into categories which represented either positive or negative themed statements, and overall there was more positive than negative feedback. Positive examples were then classified into two sub-groups, one of which related to PebblePad in that it was easy to use, appropriate and professional software and it allowed for the organisation and structuring of ideas/work. Comments such as *"I believe it is appropriate as it looks professional and can be changed and updated as well."* And *"By using PebblePad, I find it is easier for me to outline my ideas and to organise different parts of my E-portfolio."* The other category related directly to the unit teaching and learning resources in that how to use of software was well explained by the unit lecturer and the instructional guides and videos assisted them. Comments such as *"It is easy to use because [the lecturer] gave me good instructions on how to use Pebble Pad. He answered any questions and solved problems";* *"The instructional guide with screenshots was useful"* and *"The video tutorial and PebblePad guide were so helpful while doing my ePortfolio."* Negative statements were more limited. A small number of students made comments that it was hard or confusing to use, get access to and/or that it 'crashed'/they had difficulty saving their work, and that they wanted more time and explanation of the software in class. Other negative statements referred to the limitations of the software, largely in terms of colour and style options *"The only down side I can think of was that it did not provide many options for colour and style"*.

Discussion and Conclusions

Although it was a fairly low response rate, the student cohort who responded to this survey provided some interesting results and the findings are briefly discussed here in relation to the views and experiences of these particular respondents. Overall, the response from students in regards the relevance of the career ePortfolio assessment item in the development of their professional identity was positive. In completing the requirements of the nine folio pages, students commented that it assisted in the development of an understanding of their strengths and weaknesses in relation to employability skills; the reflective practice requirement assisted in the development of the specific skill of self-awareness; and, they were able to develop their career

management skills. The quantitative results, with mean scores of 4.0 or above, also showed that students could particularly see the relevance of the specific pages where they had to address and provide evidence for six employability skill behaviours using the STAR approach and provide a short personal biography.

The use of the PebblePad ePortfolio platform is currently not mandated at the university, but it is a highly recommended tool. It has been deployed in this first year business unit since 2014 and, anecdotally and from the general student unit surveys, feedback has varied on its use. As it is a first year unit, the majority of students have not previously used the software, and as identified in this survey, 90% of students were using it for the first time. A new version of the software was also being used for the first time in this semester. To assist students in the creation of their ePortfolios, the unit coordinator has developed a range of teaching and learning resources as support mechanisms. According to the quantitative results, the most useful were the “hands-on” activities undertaken in class with the lecturer (mean = 4.15) (there are two such tutorial workshops run in class by the lecturer), and then the instructional guide (with screenshots) (mean = 3.98) which is available on the student’s Learning Management System. Comments in the open-ended question also concurred with these findings. In addition, students made comments in regards the software itself in that PebblePad was easy to use, appropriate and professional and it allowed for the organisation and structuring of ideas/work. There were some negative responses about technical issues and understanding how to use the software, but these were quite limited; and some students made suggestions on how the software could be improved in terms of functionality. As one of the final questions in this survey, students were asked whether they would ever use of PebblePad to showcase themselves to an employer in the future; responses were quite positive with 72% of students indicating “probably yes” (48%) or “definitely yes” (24%). This shows willingness and an interest by this cohort to further engage with digital identity formation and representation. In summary, the findings from this small scale study indicate if the assessment item and teaching and learning resources are structured appropriately then ePortfolios can be a place where career management skills and professional identity formation can begin to develop. The challenge for many educators and institutions is to going to be in how they can truly extend and nurture these beginnings into a learning journey across a degree program and into further lifelong learning for graduate and professional employability.

References

- Bennett, J., Rowley, J., Dunbar-Hall, P., Hitchcock, M., & Blom, D. (2016). Electronic portfolios and learner identity: An e-Portfolio case study in music and writing. *Journal of Further and Higher Education*, 40, 107–124. doi:10.1080/0309877X.2014.895306
- Bridgstock, R. (2009). The graduate attributes we’ve overlooked: Enhancing graduate employability through career management skills. *Higher Education Research & Development*, 28(1), 31–44.
- Daniels, J., & Brooker, J. (2014). Student identity development in higher education: Implications for graduate attributes and work-readiness. *Educational Research*, 56(1), 65–76.

- Jackson, D. (2016). Reconceptualising graduate employability: The importance of pre-professional identity. *Higher Education Research & Development*, 1–15. doi:10.1080/07294360.2016.1139551
- Thomas, D. R. (2006). A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, 27, 237–246. doi:10.1177/1098214005283748
- Trede, F., Macklin, R., & Bridges, D. (2012). Professional identity development: A review of the higher education literature. *Studies in Higher Education*, 37, 365–384. doi:10.1080/03075079.2010.521237

Biography

Ruth Sibson

Ruth Sibson is a Senior Lecturer within the School of Business and Law at Edith Cowan University (ECU) in Perth, Western Australia. Dr Sibson currently coordinates the Sport, Recreation and Event Management Program and for the past six years has coordinated the Bachelor of Business. Her current teaching and research interests include integrating and examining the use of ePortfolios to manage and showcase student learning across both degrees, including the development of graduate professional identities. In 2011, Ruth won the Vice Chancellor's Award for Engagement in Teaching & Learning for her role in assisting students and graduates in their transition to the workplace, and in 2013 she was awarded the Academic Staff Award for the Best Practice ePortfolio at ECU for her design and use of ePortfolios for enhanced employability outcomes.

ePortfolios through the Looking Glass: Projecting our Learning into the Future

Dr Christine Slade

University of Queensland

Associate Professor Gillian Hallam

Queensland University of Technology

Abstract

This opinion paper was birthed in the reflective conversations between two higher education academics whose combined knowledge and experience spans ten years of Australian ePortfolio research and practice. A number of questions fed those conversations reflecting on the past, present and future for ePortfolio use in Australia. In offering this paper we hope to stimulate a wider collective reflection and conversation about current ePortfolio practice and how we might envisage the future.

The *NMC Horizon Report Higher Education Report 2016* predicts an increase in blended learning, bring-your-own device (BYOD) and a shift towards deeper learning that will link learner autonomy, graduate attributes and real-world experiences to help students transition to the workplace. The report also sees a significant challenge in students connecting formal and informal learning experiences. The challenge for ePortfolio advocates is demonstrating how to respond effectively to these trends.

The AeP project, commissioned by the Australian Learning and Teaching Council (ALTC) in 2007 found a strong interest in ePortfolio use for student reflection and evidencing of skills across Australian universities. The later AeP.2 project sought to develop an ePortfolio community of practice, which over time evolved into the Australian ePortfolio Forum (Hallam et al., 2008, 2009).

Since that time ePortfolio implementation has gained traction in institutional, faculty, program/course or course/unit implementations across universities. There is still strong interest in ePortfolio use for professional accreditation and career enhancement, and the development of reflective practice and other pedagogical outcomes. Implementation, however, is not an easy process (Slade et al. in press) but we can project our learnings and experiences into thinking about the future of ePortfolios.

Students are the key ePortfolio users in higher education, but there are other important stakeholders, such as staff, institutions and early adopter industry groups, to consider. In particular, we need to understand the systemic barriers and advocate change with industry and accrediting bodies to facilitate improved ePortfolio uptake.

We know there are still other areas of ePortfolio practice that could be enhanced, such as ePortfolios in student placements, employability and integration with co-curricular activities or newer areas like learning analytics. This raises a number of questions which we can discuss together. Maybe we need another audit to measure progress, a think tank involving collaboration of stakeholder groups for strategic planning or an idea from left-field. Whatever the case, we are eager to hear the opinions of the ePortfolio collective...so let the conversation begin!

Keywords: *Learner-centre pedagogies, high-impact practices, future trends, industry acceptance, ePortfolio research*

Introduction

This paper was birthed in the reflective conversations between two higher education academics whose combined knowledge and experience spans ten years of ePortfolio research and practice in Australia. A number of questions fed those conversations reflecting on the past, present and future for ePortfolio use in higher education. Then, unbeknownst to us, a complementary conversation ensued at the *CRA/AAEEBL International Seminar* in July 2016; a synergy which indicates it is a good time for the Australian ePortfolio community to take stock. Therefore, in offering this brief commentary, based on our experiences and a scan of recent ePortfolio literature, we hope to stimulate a wider collective reflection and conversation about current ePortfolio practice and how we might envisage the future.

Nearly ten years ago the seminal AeP ePortfolio project, commissioned by the Australian Learning and Teaching Council (ALTC) found strong interest in ePortfolio use for student reflection and evidencing of skills across Australian universities. Implementation was generally at the program or course level with strong involvement from passionate early adopter champions. The later AeP.2 project sought to develop an ePortfolio community of practice, which over time evolved into the Australian ePortfolio Forum we enjoy today (Hallam et al., 2008; 2009).

Since then ePortfolio implementation in Australia gained traction across institutional, faculty, programs or courses levels in a number of universities, particular with the sector drivers towards employability. There is increasing interest in ePortfolio use for professional accreditation and career enhancement, and the development of reflective practice and other pedagogical outcomes for student learning. Implementation, however, is not an easy process (Slade et al., in press). Eynon et al. (2014) suggest that 'the ePortfolio movement is at a crossroads' as budgetary constraints, accountability and rapid change impact higher education (p. 95). Effective implementation in this context requires a strategic approach to enable positive responses to change; the ability to manage all stakeholders effectively; and the provision of ongoing opportunities for ePortfolio change agents to engage in critical reflective and evaluative processes (Slade et al., in press). But still this may not be enough...

Current uses

Students are the key ePortfolio users in higher education, but there are other important stakeholders such as staff, institutions and early adopter industry groups, to consider as well when projecting our learning into the future. Students, guided by educators, use ePortfolios as an organisational tool to collect and store evidence of their competency, to reflect on and showcase both formal and informal learning over time using a range of multimodal formats (Joyes et al., 2010; Rhodes, 2010). This validation of a student's work is a major purpose of ePortfolio use because it is meaningful to a chosen audience, such as a potential employer. Educators hope that student outcomes from these processes will include the development of an integrated academic, personal and professional identity, and improved self-regulation and self-efficacy (Shroff et al., 2013; Boulton, 2014; Kahn, 2014). In exploring the transition of teacher education graduates to the workplace, who used ePortfolios in their studies, Boulton (2014) found they have a strong sense of ownership and professional empowerment. Student collaborative activities such as inter-professional education (IPE) (see Karsten et al., 2015) and mentoring (see Groißböck, 2012) are newer areas of ePortfolio exploration as is badging (Kehoe & Goudzwaard, 2015).

The use of ePortfolios by staff is sometimes overshadowed. Educators working with their students also develop new digital skills to varying levels. It is hoped that they will also embrace using an ePortfolio system for their own professional development but this may not be the case. Yet there are other staff members, both academic and professional, that eagerly adopt the use of an ePortfolio, for its intrinsic value for career enhancement and evidencing continuing professional development.

In particular, we need to understand the systemic barriers and advocate change within industry and accrediting bodies to facilitate improve ePortfolio uptake. The current limitations of ePortfolio acceptance within this group inhibits the closing of the employability loop for users. Students (and staff) can become despondent when their digital presentations are not accepted or disregarded. Although there are obvious benefits in recording and reflecting on all learnings this situation is a significant barrier to promoting the value of ePortfolios to students in academic studies and continued graduate ePortfolio use in professional practice.

Some institutions also emphasise eportfolio outcomes for performance assessment with a view to whole-of-institution quality assurance and standardised reporting. Eynon et al (2014) suggests that this practice only aligns with assessment of learning but could be included in assessment for learning through the inclusion of reflective learning outcomes for individual users as well.

ePortfolio use within and across stakeholder groups is heterogeneous and somewhat ad hoc. Many uses need further exploration and consolidation to reach maturity, and support by empirical studies to demonstrate impact. If we claim employability as a major ePortfolio driver we need to increase our advocacy work with industry to accept digital portfolios for accreditation and job applications.

Pedagogical and research considerations

There is growing scholarly articulation of ePortfolio-associated pedagogies, driven by what Batson (2016) calls a ‘flipped epistemology’ in which initial teacher-centred phases transform to a more desirable learning-centred phase through ePortfolio-enabled contextualised or authentic learning situations. Using learner-centred pedagogy focuses on individual learning experiences that encourage independent yet collaborative and reflective, lifelong learners who have the capacity to apply existing knowledge to new contexts and can adapt to new environments (Emes & Cleveland-Innes, 2003; McLean & Gibbs, 2010). The concept of integrative learning, discussed by Huber and Hutchings (2005) fits neatly with the objectives of ePortfolio use, by overcoming the fragmentation of institutional academic study through learning opportunities that make connections across contexts and experiences. The strength of ePortfolios is ‘its capacity to serve as a connector’ (Eynon et al., 2014, p. 96). Linking ePortfolios¹ with other high impact practices, such as WIL, overseas exchange or capstone courses further enhances integrative learning (Kahn, 2014; Rhodes, 2010).

While conceptual agreement may be easy to give in this situation, ePortfolio implementation can meet with resistance because it is not just about introducing a new technology but requires a massive cultural shift from teacher-centred to learner-centred approaches that should not be underestimated (Kahn, 2014). Shane Sutherland from PebblePad reminds us that ‘authentic stories of learning’ result from ‘good learning design’ so just adding ePortfolios does not fix poor pedagogy (Personal communication, July 2016). In reality, when introducing ePortfolios or other technologies educators are required to adapt their pedagogies at the same time (Slade & Readman, 2013) which can be a steep learning curve for some.

Conceptual and practice-based ePortfolio research grew in the last few years but as the areas of use broaden and mature so must the research undertakings (Jimoyiannis, 2012). There is a particular need for empirical research and evidence of impact of learning (Kahn, 2014) to strengthen the sector’s contribution to scholarship of teaching and learning (SoTL). The Becta Report in 2007 recommended future research work in developing longitudinal research (3–5 years) studies, the identification of potential audiences and their readiness to accept ePortfolios as common practice and exploration of the potential of data mining from ePortfolio use. There were some discussions at the Australian ePortfolio Forum in 2015 of the need to collaborate in inter-institutional research to advance the maturity of evidence around ePortfolio pedagogy and collect empirical evidence of practice. Perhaps we can have that conversation again this year?

ePortfolio Futures

Higher education will continue to digitalise learning. The *NMC Horizon Report Higher Education Report 2016*, for example, predicts an increase in blended learning, bring-your-own device (BYOD) and a shift towards deeper learning that will link

¹ In late July 2016 George Kuh added ePortfolios to the 2008 Association of American Colleges and Universities’ list of high-impact practices (HIPs) for student learning. This is the first time another HIP has been added. For more information see: <http://www.centerforengagedlearning.org/eportfolio-as-high-impact-practice/>

learner autonomy, graduate attributes and real-world experiences to help students transition to the workplace (Johnson et al., 2016). The report also sees a significant challenge in students connecting formal and informal learning experiences. There is an increasing need for graduates to fill hybrid jobs that merge digital capabilities with high-level analytical skills (General Assembly & Burning Glass Technologies, 2015). The *Committee for Economic Development of Australia (CEDA) Report 2015* emphasises the importance of graduates needing high levels of social intelligence, creativity, mobility and dexterity. Yet a survey of 1,484 students and graduates and 331 recruitment agencies by Internships.com and General Assembly in 2014 found that only 44 per cent of students felt they were well equipped with digital and technical skills for professional work (internships.com, 2016). Another complication is that only 18 per cent of employers felt graduates were prepared (internships.com, 2016). Students expect their university study to be customer-driven with flexible service delivery in order to be competitive in the job marketplace (den Hollander, 2015). Although the majority of students are digitally literate in terms of using different technologies the challenge now for educators is to help them learn how to create or adapt technology to solve problems in readiness for professional practice (Ventimiglia & Pullman, 2016).

The challenge for ePortfolio advocates is demonstrating ways in which ePortfolios can respond effectively to these trends. We know there are still areas of ePortfolio practice that could be enhanced, such as student placements and career development. Or perhaps there is room for the development of newer areas such as learning analytics, peer-review and collaboration. It raises a number of questions... Do we need some calibration in our approach or updating of our language around the value of using ePortfolios? How can we synchronise our ePortfolio message with the wider changes or needs of our institutions and their partners? Is the message too narrow? Are there other uses for ePortfolios? User buy-in — are we realistic about that? These are all questions we can discuss together. Maybe we need another audit to measure progress, a think tank involving collaboration of stakeholder groups for strategic planning or an idea from left-field. Whatever the case, we are eager to hear the opinions of the ePortfolio collective...so let the conversation begin!

References

- Batson, T. (2016, June 14). *The Edinburg challenge: If eportfolios are so great, why aren't more people using them?* President of AAEEBL Blog Post. Retrieved from <http://www.aaeebl.org/blogpost/1008436/249771/The-Edinburgh-Challenge-If-eportfolios-are-so-great-why-aren-t-more-people-using-them>
- Becta. (2007). *Impact study of e-portfolios on learning*. Retrieved from <http://www.becta.org.uk>
- Boulton, H. (2014). ePortfolios beyond pre-service teacher education: A new dawn? *European Journal of Teacher Education*, 37(3), 374–389.
- Committee for Economic Development of Australia (CEDA). (2015). *Australia's future workforce?* Melbourne Vic.: Author. Retrieved from http://adminpanel.ceda.com.au/FOLDERS/Service/Files/Documents/26792~Future-workforce_June2015.pdf

- den Hollander, J. (2015). A brace new world of higher education. In *Australia's future workforce?* (pp. 225–233). Melbourne, Vic.: Committee for Economic Development of Australia (CEDA). Retrieved from http://adminpanel.ceda.com.au/FOLDERS/Service/Files/Documents/26792~Futureworkforce_June2015.pdf
- Emes, C., & Cleveland-Innes, M. (2003). A journey toward learner-centred curriculum. *The Canadian Journal of Higher Education*, 33(3), 47–69.
- Eynon, B., Gambino, L., & Török, J. (2014). What difference can ePortfolio make? A field report from the connect to learning project. *International Journal of ePortfolio*, 4(1), 95–114.
- General Assembly & Burning Glass Technologies. (2015). *Blurring lines how business and technology skills are merging to create high opportunity hybrid jobs*. Retrieved from http://burning-glass.com/wp-content/uploads/Blurring_Lines_Hybrid_Jobs_Report.pdf
- Groißböck, P. (2012, November). Teaching e-Portfolios in teacher education. *International Journal of Emerging Technologies in Learning*, 7(Special issue 2, FNMA).
- Hallam, G., Harper, W., McAllister, L., Hauville, K., & Creagh, T. (2009). *Australian ePortfolio practice — Stage 2: Developing a sustainable community of practice*. Brisbane, Qld: Queensland University of Technology.
- Hallam, G., Harper, W., McCowan, C., Hauville, K., McAllister, L., & Creagh, T. (2008). *ePortfolio use by university students in Australia: Informing excellence in policy and practice, Australian ePortfolio Project, Stage 1*. Brisbane, Qld: Queensland University of Technology.
- Huber, M., Hutchings, P., & Gale, R. (2005). Integrative learning for liberal education. *Peer Review*, 7(4), 4–7.
- Internships.com. (2016). *New skills gap survey reveals increasing student demand for digital skills, employer appetite for tech savvy hires*. Retrieved from <http://www.internships.com/about/news/new-skills-gap-survey-reveals-increasing-student-demand-for-digital-skills-employer-appetite-for-tech-savvy-hires>
- Jimoyiannis, A. (2012). Developing a pedagogical framework for the design and the implementation of e-portfolios in educational practice. *Themes in Science & Technology Education*, 5(1/2), 107–132.
- Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016). *NMC Horizon report: 2016 higher education edition*. Austin, TX: The New Media Consortium.
- Joyes, G., Gray, L., & Hartnell-Young, E. (2010). Effective practice with e-portfolios: How can the UK experience inform implementation? *Australasian Journal of Educational Technology*, 26(1), 15–27.
- Kahn, S. (2014). E-Portfolios: A look at where we've been, where we are now, and where we're (possibly) going. *Peer Review*, 16(1), 4–7.

- Karsten, K., McMillan Coddington, D., Lehman, R., Pierce, C., Tom, M., & Gallo-Silver, L. (2015). Facilitating interprofessional collaboration through ePortfolio: A pilot study. *International Journal of ePortfolio*, 5(2), 181–188.
- Kehoe, A., & Goudzwaard, M. (2015). ePortfolios, badges, and the whole digital self: How evidence-based learning pedagogies and technologies can support integrative learning and identity development. *Theory Into Practice*, 54(4), 343–351.
- McLean, M., & Gibbs, T. (2010). Twelve tips to designing and implementing a learner-centred curriculum: Prevention is better than cure. *Medical Teacher*, 32(3), 225–230.
- Rhodes, T. (2010). Making learning visible and meaningful through electronic portfolios. *Change: The Magazine of Higher Learning*, 43(1), 6–13.
- Shroff, R., Trent, J., & Ng, E. (2013). Using e-portfolios in a field experience placement: Examining student-teachers' attitudes towards learning in relationship to personal value, control and responsibility. *Australasian Journal of Educational Technology*, 29(3), 143–160.
- Slade, C., Murfin, K., & Trahar, P. (in press). A strategic approach to institution-wide implementation of ePortfolios. In J. Rowley (Ed.), *ePortfolios in Australia*. Springer.
- Slade, C., & Readman, K. (2013, July 1–4). New pedagogical e-spaces: Keeping pace with staff readiness. In S. Frielick, N. Buissink-Smith, P. Wyse, J. Billot, J. Hallas, & E. Whitehead (Eds.), *Research and development in higher education: The place of learning and teaching* (Vol. 36, pp. 433–443). Auckland, NZ.
- Ventimiglia, P., & Pullman, G. (2016, March/April). From written to digital: The new literacy. *EDUCAUSE Review*.

Biography

Christine Slade

Christine Slade is a Lecturer in Higher Education in the Institute for Teaching and Learning Innovation (ITaLI) at the University of Queensland. As part of her work, Christine is the Learning Advisor for their ePortfolio project, particularly focusing on pedagogical outcomes for students. Prior to this work, in her role as the Academic Developer (ePortfolios) at the University of the Sunshine Coast, she was responsible for the university-wide ePortfolio implementation (2014–2015), which was preceded by an Early Adopter Phase (2013) and an ePortfolio Feasibility Study (2012). In 2015, Christine was a recipient of a prestigious national Platinum LearnX Impact Award in recognition of this work and also received a commendation for excellence in innovation in the 2015 ATEM/Campus Review Best Practice Awards in Tertiary Education Management. Christine's work is highly regarded in the international ePortfolio community and she has published widely in the sector.

ePortfolio improves ‘scientist-based’ integrative professional and career development learning in a 3rd year undergraduate Cancer Sciences course

Jia-Lin Yang

University of New South Wales

Abstract

The paper focuses on the way that the author changed or developed the students’ thinking used an interactive ePortfolio to improve a ‘scientist-based’ integrative professional, career and ePortfolio learning (IPCEL) in a 3rd year undergraduate Cancer Sciences (PATH3208) course at UNSW Australia. Science is a difficult subject for most students, who believe it involves learning dense theories and abstract concepts rather than being about a method or process of inquiry. They are also often unsure about what ‘to do’ with a science degree. Those who supervise students talk about the need for students to become independent researchers. The author created and worked as the course convenor to have delivered the IPCEL curriculum to meet the students’ needs. Specifically, incorporating the interactive ePortfolio into the IPCEL aimed to use ePortfolio to integrate and enhance student’s professional and career development. The author [1] sets up a site in Moodle for individual students to write their ePortfolios and receive feedback from the author periodically, [2] run an ePortfolio tutorial at the beginning of the course, introducing theories, advantages and examples of student ePortfolios, and enabling students to confidently take the step to give it a go, and [3] create a synergistic ePortfolio, professional and career (SEPC) learning model to guide student ePortfolio practice. The distinctively interactive ePortfolio is designed to help students identify clear personal career goals, record and reflect on their fortnight learning both on and off campus, analyse their strengths and weaknesses in real world based research activities. These help students to expand their knowledge base, and adjust beliefs and behaviours to build an understanding of and a disposition towards the vocation of a scientist. The application of the ePortfolio has synergised student ‘scientist-based’ IPCEL through additional and intentional inquiry, integration and reflection, and builds a student’s personal credentials and capabilities. The IPCEL gives students an ‘apprenticeship’ or ‘internship’ in becoming scientists and encourages students to develop the understanding and professional skills for a career in science, providing students with the confidence and capabilities needed ‘to be’ a scientist and leading to careers in science. The consequence of the IPCEL approach on students by the end of the course is a high proportion of them get into postgraduate research studies, of whom over half are female, because the students have been motivated as evident by high academic performance, high satisfaction and high self-efficacy.

Keywords: *Interactive ePortfolio, ‘Scientist-based’ IPCEL Curriculum, Inquiry, Integration, Reflection*

Introduction

The challenge for teachers is to create courses that can motivate and encourage students to 'think more like specialists' and to apply the knowledge learnt to their professional careers. Science is a difficult subject for most students, who believe it involves learning dense theories and abstract concepts rather than being about a method or process of inquiry. They are also often unsure about what 'to do' with a science degree. Those who supervise students talk about the need for students to become independent researchers. I believe a student's capability and employability in the field of science is not solely determined by an academic qualification. Other qualities are important, including constructing disciplinary knowledge in its interdisciplinary context, effective communication and collaborative learning, curiosity, an inquiring mind, self-directed learning, critical thinking, problem solving, reflection and personal presentation. Students as suggested by Tomlinson (2008) are also aware of the competition they face for highly sought-after jobs and the pitfalls of relying solely on their academic qualifications in securing that employment. In addition to my own reflections as a previously research-only academic, these considerations led me to change my educational approach from 'a standard science learning' to an emphasis on 'learning as a scientist'.

Furthermore, a digital revolution has changed learning in terms of location, time, and strategy, a student learning happens everywhere and all the time. Therefore, it is a trend to apply ePortfolio in different education contexts. An ePortfolio is "a digitized collection of artefacts including demonstrations, resources, and accomplishments" (Lorenzo & Ittelson, 2005) that enables a space to evidence learning, research and assessment by an individual, group, or institution. In 2007, the Australian Learning and Teaching Council (ALTC), commissioned an intensive research project to examine the use of ePortfolios by university students in Australia. The project was awarded to a consortium of four universities: Queensland University of Technology as lead institution, The University of Melbourne, University of New England and University of Wollongong. The research findings revealed that there was a high level of interest in the use of ePortfolios in the context of higher education, particularly in terms of the potential to help students become reflective learners who are conscious of their personal and professional strengths and weaknesses, as well as to make their existing and developing skills more explicit (AeP, 2008). We believe that a student ePortfolio is a learning-centered, student owned and managed collection of digital resources that include examples of formal and informal learning materials and activities from the course, artefacts that have been designed and developed to deliver professional skills and career intervention, facilitate reflection, and provide evidence of a student's learning in the course (Yang et al., 2015).

Aim

The aim of this article is to introduce how the author has changed or developed the students' thinking using an interactive ePortfolio to improve 'scientist-based' integrative professional, career and ePortfolio learning (IPCEL) in a 3rd year undergraduate Cancer Sciences (PATH3208) course at UNSW Australia.

Incorporating ePortfolio into IPCEL curriculum

I designed the 'scientist-based', integrative professional, career and ePortfolio learning curriculum in 2012 (Yang et al., 2013; 2014; 2015), with the support of Professor Nicholas Hawkins, the Head of School of Medical Sciences, in meeting the students' needs. I then have served as the course convenor to deliver the IPCEL for 3rd year students of the PATH3208 course. I use the term 'scientist-based' to represent an outcome-based, authentic and integrative learning approach and designed the IPCEL intervention around six broad areas (Figure 1) for PATH3208, focusing on integrating professional knowledge and skills, career awareness and employability and ePortfolio learning in the real world. For showing my design I used 2 SmartArt template diagrams from the Microsoft PowerPoint-2010. One of the diagram, but not the content is similar to the one presented in the articles of Fisher and Hill (2014; 2015).

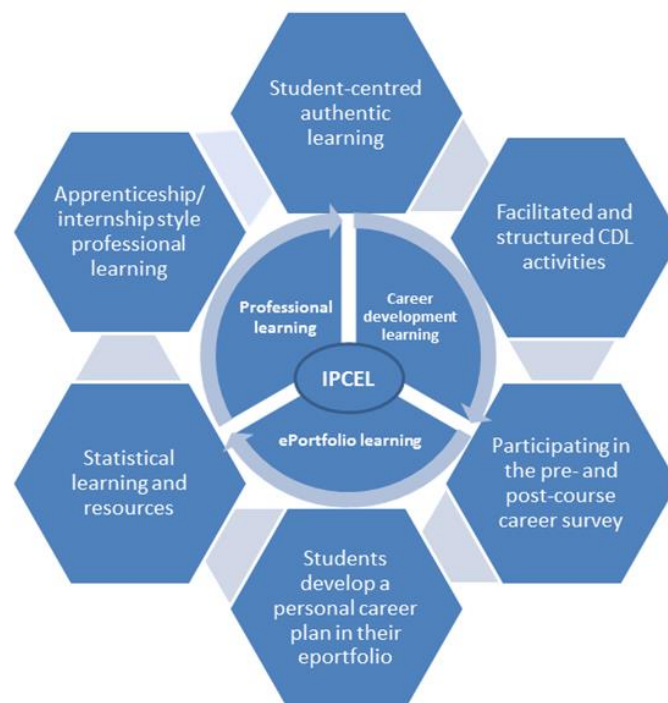


Figure 1: A 'scientist-based', integrative professional, career and ePortfolio learning (IPCEL) curriculum.

Incorporating an interactive ePortfolio into the IPCEL aimed to use ePortfolio to integrate and enhance student's professional and career development. International ePortfolio specialist feedback on my course design and IPCEL at the manuscript-peer-review noted:

The proposed study would be a welcome addition to international ePortfolio studies in that it would extend the disciplinary foci and include an international perspective that has a general focus in Australia. This is a promising design that contributes to a much-needed area of ePortfolio research, how ePortfolios can improve students' self-directed learning towards their career aspirations.

(ePortfolio Specialist, 2013)

ePortfolio

We know that simply including ePortfolio as a learning tool in the IPCEL curriculum doesn't automatically guarantee student's participation and success for the learning purpose in the course. In order to best use ePortfolio in different learning contexts, I:

- set up an interactive ePortfolio site in Moodle for students to regularly write personal ePortfolios and receive periodic feedback from me.
- run an ePortfolio tutorial to improve student's engagement and motivation.
- create an ePortfolio associated learning model to guide student ePortfolio practice.

Interactive ePortfolio

I set up an ePortfolio site using the Moodle Learning Management System (Moodle™ Version 2–2.9, Moodle Pty Ltd, Perth, WA, Australia), as both a personal and interactive forum for students to contribute to their personal ePortfolios fortnightly and receive periodic feedback from me. The distinctively interactive aspects of the ePortfolio such as formal and informal assessment, answers, suggestions, discussions, compliments and encouragement are designed to help students identify clear personal career goals, record and reflect on their fortnight learning both on and off campus, analyse their strengths and weaknesses in real research activities. This builds understanding of and a disposition towards the vocation of a scientist. The ePortfolio provides a useful means for students to additionally and intentionally inquiry, integrate and reflect on IPCEL, personalise their credentials, and customise their professional presentations and digital identity. I find my prompt feedback is a positive reinforcement for student ePortfolio learning. I also receive student feedback on course activities for further course development through this method.

ePortfolio tutorial

I run an ePortfolio tutorial at the beginning of the course, introducing theories, advantages and examples of student ePortfolios and how they will be assessed. At the end of the tutorial students will be able to understand the definition of ePortfolio (a digital archive), know the functions (collect, select, reflect, present, and curate) and benefits (self-directed learning, cognitive learning, integrative learning, transferring to long-term memory, life-long and life wide learning, career development learning, metacognition, self-regulation, management of time as well as physical and social environment, and alternative and authentic assessment), know techniques (use personal forum at PATH3208 Moodle site or at other site that a student has used before, control, update, reflect and/or share their ePortfolios), use ePortfolios for presenting and reflecting their learning anywhere at any time, use ePortfolios as resources for assignment of tailored cover letter and resume, and understand ePortfolio assessment criteria and submission requirement (a summary plus regular reflections). This tutorial enables students to understand the significance of ePortfolio and confidently take the step to give it a go.

A Synergistic ePortfolio, Professional and Career (SEPC) learning model

I create a Synergistic ePortfolio, Professional and Career (SEPC) learning model (Figure 2) that demonstrates how the interactive ePortfolio enhance students' professional and career development learning in the IPCEL.

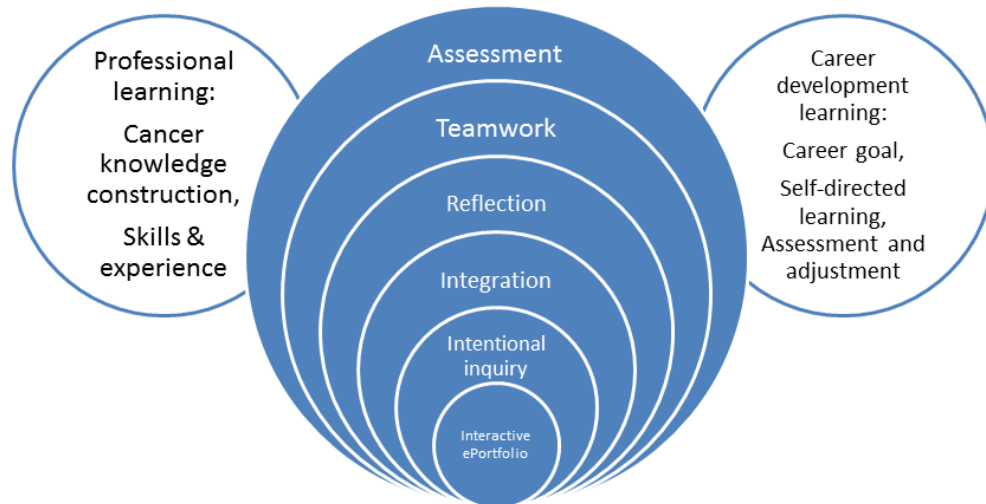


Figure 2: A SEPC learning model.

In this model, students under facilitation of a facilitator (a course convenor, an academic, a tutor or a peer) use interactive ePortfolios to enhance their personalised professional and career development learning. The ePortfolio learning is beyond professional and career development learning. Through intentional inquiry based on personal analysis of strengths and weaknesses via a student ePortfolio, students acquire career goals, specific knowledge, skills and experience in learning activities on or off campus one by one. These separate learning components are put together or further integrated in ePortfolios to form networks, frameworks, structures or images. The synthesised assumptions of knowledge, conceptual framework or structure or image are judged through personal reflection(s) and reacquired and justified at higher level. Social contact such as teamwork or organisational or community activities can improve learning and reflection. Formal or informal assessment has direct impact on justification of previous beliefs. The interactive ePortfolios, in which a student undergoes regular intentional inquiry, integration and reflection and receives periodic feedback from a facilitator, provide extra opportunities for students to justify their beliefs from any aspects, anywhere and anytime. If performing well, this interactive ePortfolio learning approach will synergise students' professional and career development learning.

Interactive ePortfolio enhances IPCEL

Through an interactive ePortfolio, I encourage students in undergraduate courses to record and reflect on their integrative professional and career development learning, both on and off campus. Students write fortnightly in their ePortfolios, to which I give periodic feedback to show my respect, give positive evaluation, provide answers or suggestions, and encourage students to practice and improve their reasoning skills.

The application of the ePortfolio has synergised student 'scientist-based' IPCEL through combination of intentional inquiry, integration, reflection, teamwork and/or assessment approaches. This combination approach builds a student's personal credentials and capabilities.

ePortfolio synergizing IPCEL

Students realized that ePortfolio can benefit their professional and career development.

My eportfolio did serve as a place to record the aspects of learning that resonated most, their links with my life, questions they raised and the further knowledge I was motivated to seek.

However, more importantly my learning I feel has been enhanced by my experiences outside the formal classroom. Not only has this 'internship' re-shaped the manner in which I approach scientific publications and study design, it has changed me as a person in that I've developed a new persona within myself as "The Researcher".

In short, this practice of reflection has highlighted for me why science was (and still is by some,) considered a philosophy. It has taught me that science applies not only to a laboratory setting, but is a way of life in that it sneaks into every aspect of everything we do. It is our duty to extract as much meaning from it as possible as learning is no mean feat for a static mind, but demands a dynamic commitment and openness to learning!

Intentional inquiry

I use an authentic learning approach to enable students to learn science from the real world. 'To do as a scientist does' exposes students early in an apprenticeship/internship learning stage, which is critical for building independent research ability. I designed the curriculum and co-curriculum activities, in which students, like a scientist, acquire and construct cancer-specific knowledge. Through this approach, students develop many skills and understand the general activity of scientific research:

In Dr Yang's comments to my reflection last week, he made a rather enlightening point about how science is about hypothesis making and research is about testing these hypotheses. In the most unexpected way, these words I hope will stick with me forever as sometimes we get so caught up in the actual "doing" of things, that we tend to leave our goals behind.

Gradually students realized:

Research is not merely a process of testing hypotheses, but a constant field of questioning and advancement. I believe that the process of reflection is the gateway to being able to question your own thoughts and rationales.

Self-development through intentional inquiry and reflection:

The statement A/Prof Yang highlighted in my first reflection, "In order to truly evolve within the course, you need to go beyond what it taught to how it can influence and impact future learning and career options and opportunities," is exactly what this course has been about and I am truly grateful for the self-development opportunities that it has provided.

Intentional inquiry based on personal needs:

It was almost what some may call an out of body journey, where you step outside of your microcosm of learning and look at yourself critically or otherwise to see the nooks and crannies that need improvement.

Integration

Profession is a career. Building both professional and career capabilities is a basic requirement of my course. I developed specific career tutorials through the ePortfolio for students to learn about career opportunities, job-search strategies, goal setting, personal achievement recording, resume writing and interview techniques. Students thereby gain a clear image of a scientist and are confident and prepared for employment:

Scientific research as a career that I would not have anticipated had I not taken part in this internship.' 'This tutorial based on the resume and cover letter task was very helpful for the future, as we learnt how to stand out from other applicants that are applying for the same job. By providing us with situation examples, A/Prof Yang guided us on what employers look for in a potential employee and how to succeed in answering interview questions. This was valuable knowledge that I will use to help me get a job.

Another student summarized through reflection and integration:

This course was unique. It's not just about the theory of cancer itself, but it's applications in the real world, that this course does not just teach you what a cancer cell does, but it teaches you how it can be treated, what techniques can be treated, what is used to treat it, the processes to make the treatment, etc. It also teaches you about where we as a budding scientist come into all this.

Students are confident in doing as a scientist:

This course has given me an insight of what it would be like to be a scientist. It has taught me valuable skills that I will need for Honours and most importantly for my career. I do intend to embark upon my goal and this course has made me believe that I can do it. I just need to work harder and I will.

Reflection and transfer

Students used reflection in their learning and transfer their experience in different contexts.

One student talked about relationship between cooking and experiment:

Overall, I agree with Professor Yang that cooking is similar to science (experiment). Before making the dumplings, I had to think thoroughly about what kind of ingredients I need. During the dumpling-making procedures, I also made some observations say the fillings were quite dry which might make the dumplings not juicy enough. After the “experiment”, I needed to think about what kind of improvements I need to make for next time. The whole cycle is exactly the same as the reflective model illustrated in the first lecture. So, I think I have already experienced how the model runs through cooking. I hope I can put the model in my SOMS internship and future research project as well.

Another introduced application of teamwork skills in his job:

As part of my work every fortnight crew members group together as a team and discuss the positive and negative experiences everyone faced with the store manager. Nobody knew how to do it at first, I decided to take the responsibility and take notes based on PATH3208 outline and decided to allocate roles so that people can report clearly. Everyone was happy and all issues were addressed.

Teamwork

I place particular importance on the position of scientists as collaborators in collective inquiry into the world. I nurture the curiosity of students, and unlike much traditional teaching in the STEM field, I encourage questioning and scepticism from student-scientists.

A student noted:

Group work, I have come to discover, is a lot about communication and patience. This has allowed me to come to an understanding of the significance of collaborative work — not only in working together to achieve something great, but also allowing other people to enrich my understanding and help me to develop a wider, more holistic approach to a problem or situation.

Another student described a problem solving story:

The key to overcoming teamwork issues is with empathy and communication skills. I am glad I spoke to her (dominant problem) individually so she did not feel attacked and I believe our group dynamic is better now.

Assessment

In acting like scientists, students participate in assessment as academic partners, from individual critical analysis of a published scientific research article to marking as collaborative peer assessors of group project design presentation. This experience as both learner and assessor improves student reflective learning and comprehension.

A student indicated:

I believe that the process of self-assessment is even more important to a doctor than it is for a researcher.

Another student commented:

One of the skills I had learnt from my first tutorial was to critically analyse a scientific research paper. In my other courses, we were not really exposed on

how we analyse a paper and I'm thankful that I have grasped this vital skill', and 'It's good to watch and evaluate other people's presentation because not only do you learn the diversity of studies but you also have an opportunity to observe the strengths and weaknesses of a group presentation skills as well as their project.

Life-long and life-wide learning

Students can copy their ePortfolio to an external free website for future (life-long) learning and reflection. They can also adjust their career goals at any time reflecting on their experience and feedback for life-wide learning.

An undergraduate student noted:

I felt I have learnt a lot during this past semester. By combining the theory of cancers with practical application in the co-curricular classes and tutorials, I believe that this course has set me in good stead not only for my honours next year but also the rest of my career in the field of medicine. As I have mentioned previously in my reflection, in addition to increased knowledge of cancers, their challenges and future treatments, I now have better developed skills which I will carry through life, including: Critical thinking and analysis, Writing a successful resume and cover letter, Proper interview technique and Communication skills.

Feedback from a graduate with average performance in my course indicates a high research potential in life-long learning:

As a result of the PATH3208 course, I chose to undertake an Honours year at the University of Technology, Sydney after talks with a supervisor I had previously known. Although I was only an average student, I found the skills provided within the course extremely advantageous and greatly assisted me in getting a first class honours. Additionally, I have also been able to get my name on two first author publications (Manuscripts in review) as well as obtain an APA (Australian Postgraduate Award) scholarship for supporting my PhD study.

A student described her life-wide learning skills:

Though I will not specifically be doing research in cancer, I felt the skills obtained through research design, literature reviews, presentations and working in group environments will assist me throughout a research career and work environment. I also have a deeper appreciation of medical techniques and how they assist in research and clinical work to better understand and diagnose diseases. I have felt the course I have chosen this semester has given me a new perspective of my goals particularly evident in myself now undertaking an honours year.

Another student mentioned:

In the future, I will be able to apply these skills not only next year but also in my discipline of medicine, such as during doctor-patient interaction, which will require proper communication skills as well as critical thinking for diagnosis and treatment. Furthermore, critical thinking and decision making will also be required in research experiments and surgery, all options which I am keeping open at this current stage of my education. I honestly feel that this course has

improved many aspects of knowledge and thinking and I look forward towards research and medicine in the future.

Outcome

The effectiveness of the interactive ePortfolio approach is verified by full student participation and high quality learning records and reflection. Colleagues identify the ePortfolio work as an exemplar in the Faculty's Teaching Toolkit (<http://teachingtools.med.unsw.edu.au>).

The PATH3208 course consistently gets very high (>90%) student satisfaction from the Independent Course and Teaching Evaluation and Improvement (CATEI) Survey.

Embedding research in learning and teaching (L&T) provides a better understanding of the effectiveness of learning activities. I adapted the international standard Career decision making and self-efficacy (CDMSE) survey as a valid and highly reliable instrument to measure student confidence in career development education. Our studies indicate that PATH3208 students were much more confident in 4/5 aspects of self-efficacy, including self-appraisal, obtaining occupational information, planning and problem solving from pre- to post- IPCEL intervention (Yang et al., 2015). This learning approach was further tested in five senior science courses, with four courses receiving IPCEL and the other a previous L&T approach. I observed significant improvement in students' self-efficacy within the four IPCEL courses, but not in the non-IPCEL course, indicating that the significant gain in student self-efficacy was a specific benefit of IPCEL, for both female and male students (Yang et al., 2016).

The overall impact of the IPCEL on student learning in the PATH3208 course is evident in very high academic performance in the science program, with significantly higher course mark and weighted average mark (WAM) than 3rd year school average mark and WAM (79 versus 72, and 84 versus 73, respectively; Mann-Whitney test, all $p < 0.01$).

The average course mark is higher than the entry threshold of postgraduate courses, and so PATH3208 students continued their studies in high proportions: 44% honours, 12% Masters, 5% PhDs, 10% Medicine. As noted above, we achieved high levels of young women continuing their research (51% vs 47% school honours female rate).

Conclusion

This article described the impact of incorporating an interactive ePortfolio into the 'scientist-based', integrative professional, and career development learning curriculum, the SEPC learning model behind this approach, IPCEL trial and outcome, focusing on how the author has changed or developed the students' thinking using the interactive ePortfolio to improve the IPCEL. The experience gained from trialling the model and the learning pedagogy in the Cancer Sciences (PATH3208) course detailed in this article supports the application of the IPCEL for senior science students to develop a scientific approach as well as vocational skills in a real world setting. In addition the application of the interactive ePortfolio in the IPCEL can synergise student professional and career development through additional intentional inquiry based on personal learning needs, integration across curricular

and co-curricular learning and reflection from personal and collaborative learning activities on and off campus.

Acknowledgement

I would like to thank Mita Das, Nicholas Hawkins, Patsie Polly, Kathryn Coleman, Belinda Allen and all other Cancer Sciences course staff for their support and assistance in course delivery. I would also like to thank all PATH3208 students for active participation in IPCEL and sharing their ePortfolios. Finally, I gratefully acknowledge the Learning and Teaching Seed Fund Support provided by the Learning and Teaching Unit UNSW Australia.

References

- Australian ePortfolio Project (AeP). (2008). *Australian ePortfolio project: ePortfolio use by university students in Australia: Informing excellence in policy and practice*. Retrieved from http://eprints.qut.edu.au/31912/1/AeP_Report_ebook.pdf
- Fisher, M. B., & Hill, A. J. (2014). Eportfolio adoption and implementation in a multiple campus university environment — a reflection on opportunities and challenges in learning and teaching at the Australian Catholic University. *Proceedings of the London International Conference on Education* (p. 345). London UK: Infonomics Society.
- Fisher, M. B., & Hill, A. J. (2015). Eportfolio implementation in a multiple campus environment 4 — disruptive change and innovation. *International Journal for Infonomics (IJ)*, 8(4), 1077–1083. Retrieved from <http://infonomics-society.org/wp-content/uploads/iji/published-papers/volume-8-2015/Eportfolio-Implementation-in-a-Multiple-Campus-Environment-4-Disruptive-change-and-Innovation.pdf>
- Lorenzo, G., & Ittelson, J. (2005). *An overview of E-portfolios*.
- Tomlinson, M. (2008). The degree is not enough: students' perceptions of the role of higher education credentials for graduate work and employability. *British Journal of Sociology of Education*, 29, 49–61.
- Yang, J-L. (2014). Using e-STATS-CHOICE to improve efficiencies in providing feedback. In *Learning and teaching forum: Moving feedback forward: Innovation and opportunity*. Sydney: NSW: University of New South Wales.
- Yang, J-L., Coleman, K., Das, M., & Hawkins, N. (2013). Efficacy of ePortfolios and career development learning in Cancer Sciences course. *Proceedings of the AAEEBL Ann Conference, Boston, USA*, 29(TH91).
- Yang, J-L., Coleman, K., Das, M., & Hawkins, N. (2014, July 15–17). *Career development learning and ePortfolios: Improving student self-efficacy in employability skills in an undergraduate science course*. The International Conference on Learning, Lander College for Women at Touro College, New York, USA.

- Yang, J-L., Coleman, K., Das, M., & Hawkins, N. (2015). Creative course design and integrative learning and teaching: Delivery of specific knowledge and career skills by ePortfolio Learning. In K. S. Coleman & A. Flood (Eds.), *Capturing creativity through creative teaching*. Champaign, IL: The Learner, Common Grounds Publishing. Available from <http://thelearner.cgpublisher.com/product/pub.62/prod.46>
- Yang, J-L., Coleman, K., Das, M., & Hawkins, N. (2015). Integrated career development learning and ePortfolios: Improving student self-efficacy in employability skills in an Undergraduate Science Course. *International Journal of Adult, Community and Professional Learning*, 22(1), 1–17. Retrieved from <http://jialinyang.cgpublisher.com/product/pub.255/prod.57>
- Yang, J-L., Polly, P., Fath, T., Jones, N., & Power, J. (2016). ISA model and integrative career development learning in year three science courses. *International Journal of Science, Mathematics and Technology Learning*, 23(3), 33–46. Retrieved from <http://ijlsmtl.cgpublisher.com/product/pub.266/prod.111>

Biography

Jia-Lin Yang

Jia-Lin Yang is currently a teaching and research academic at the Prince of Wales Clinical School, Faculty of Medicine, UNSW Australia. He got MBBS, MEd, and PhD degrees. He had a clinician and statistician background and multidisciplinary knowledge. He is the creator and convenor of cancer sciences course. He is an inventor and one of developers of e-STATS-CHOICE program and Easy Statistics Videos. He presents at L&T events including connections seminars, annual forums and international conferences. His teaching approach is also recognised in grants, awards and publications, including an Outstanding teaching award in his Faculty and many publications. Colleagues identify the ePortfolio and Camtasia video work as exemplars in the Faculty's Teaching Toolkit (<http://teachingtools.med.unsw.edu.au>). International peers invite him to participate in world ePortfolio leadership activities, including an active member of the organization committee of the 2016 Boston ePortfolio conference and a coinvestigator of the field guide of ePortfolio project.

A Portfolio approach to clinical competency assessment in Oral Health/Dentistry

Terry Young

La Trobe University

Ron Knevel

La Trobe University

Sarah Down

La Trobe University

Abstract

This case study presentation will describe an innovative portfolio methodology to assess Dentistry and Oral Health students against the standards for professional registration. Students develop reflective practice through weekly journaling. Whilst in teaching clinic, a 360 feedback framework is utilized with input from student peers, patients, clinical educators and teaching facilitators. An extensive set of rigorous professional competencies is tracked and recorded for each student. Real-time assessment data is collected for comparison, evaluation, and individual feedback. Clinical Educators and teaching staff can efficiently track individual progress with a rich history of student progression. Students are highly engaged with evidence of their learning in one repository. Assessment is supported with the inclusion of rich digital media radiographs and patient communication videos. The program has been highly successful and will be embedded into the broader curriculum.

Keywords: *oral health, dentistry, feedback, clinical assessment, reflection*

Background

Within the Oral Health and Dentistry teaching program, clinical education and assessment are critical. Student competencies must be assessed and validated as a requirement for graduate professional registration. The program aims to support students to develop ongoing reflective practice to maintain professional competence and support certification of competence. This process stimulates goal setting for improvement of clinical and critical thinking skills.

A key feature of the teaching program is to provide useful feedback for students and teaching staff. Feedback is an essential part of the formative aspect of the construction process and growth (Kolb, 1998). This entails developing a 360 degree feedback framework which includes peer review, student feedback, clinical educator feedback, placement agency feedback and patient feedback. Analysis of student feedback data will facilitate benchmarking of students, real time monitoring of progression in clinic, and inform the teaching program to best support weaker students. Analysis of feedback data from clinical educators will allow us to compare

and calibrate the teaching to be more consistent for students. We hope to facilitate discussion amongst our tutors (Amsellem-Ouazana, van Pee, & Godin, 2006).

We plan to analyse the rich data sets collected to inform our future teaching programs and support a better student learning experience.

Problem

Students are currently assessed using paper-based criteria lists, assessment sheets, and reflective diaries. Students must manage paper-based folders, with staff access dependent on asking students for paper-based records. The current system does not promote student reflection in 'real time' or support timely and constructive feedback. There is little opportunity for communication between academics, clinical educators, and students, or moderation of feedback across geographically dispersed sites. The system is labour intensive, costly and does not maximise opportunities for strengthened partnerships between students, educators, and university academics, or progressive feedback to improve student learning.

Approach

The key objectives were to move the clinical assessments online to a PebblePad Workbook. This would facilitate online monitoring of student progression, 'real-time' reflection and feedback between student and educator. An online system would support the sharing of feedback between colleagues (internal and external academics and clinical educators), and moderation of assessment and feedback performance by clinical educators at different sites.

An initial pilot was run using a small group of students over the summer of 2014. A larger scale implementation with 25 students in the final year of their studies was initiated in December 2015. In March 2016 the project included 25 second year oral health students and 40 third year dentistry students.

Students were asked to perform the following tasks:

1. Attend weekly dental clinics and review patients.
2. For each patient, create a clinical patient record.
3. If required take radiographs and create radiograph worksheet records.
4. Create videos to demonstrate patient/practitioner communication.
5. Provide a peer review of patient interaction of another student.
6. Where appropriate, ask patients for feedback.
7. Write a weekly reflection the week's clinical activities.

Clinical assessment

Evaluation of student performance with patients through feedback from supervising clinical educators is critical to the student learning process. The clinical assessment process was as follows:

- Student would see patient and create a clinical patient record
- Educator would review patient record and provide written feedback

- When student felt ready, they would nominate to be evaluated
- Educator assesses student clinical performance and records achievement of successful completion of competency

Portfolio design

The portfolio consisted of the following elements/components:

- “About Me” summary (Figure 1) included a summary of student’s personal details and rationale for pursuing a career in Oral Medicine/Dentistry.
- Reflective diary included a weekly reflection of personal performance in clinic.
- Clinical Patient records created in clinic.
- Records of successful completion of competency (Figure 2) included a summary of competencies completed and a key document to track student progression.
- Radiography Worksheets (Figure 3) included patient records and a digital copy of radiograph taken
- Communication Video Worksheets (Figure 4) includes a video record of the communication between student and patient.
- Chair-side assisting and other relevant activities worksheets.
- Clinical Peer review by students.

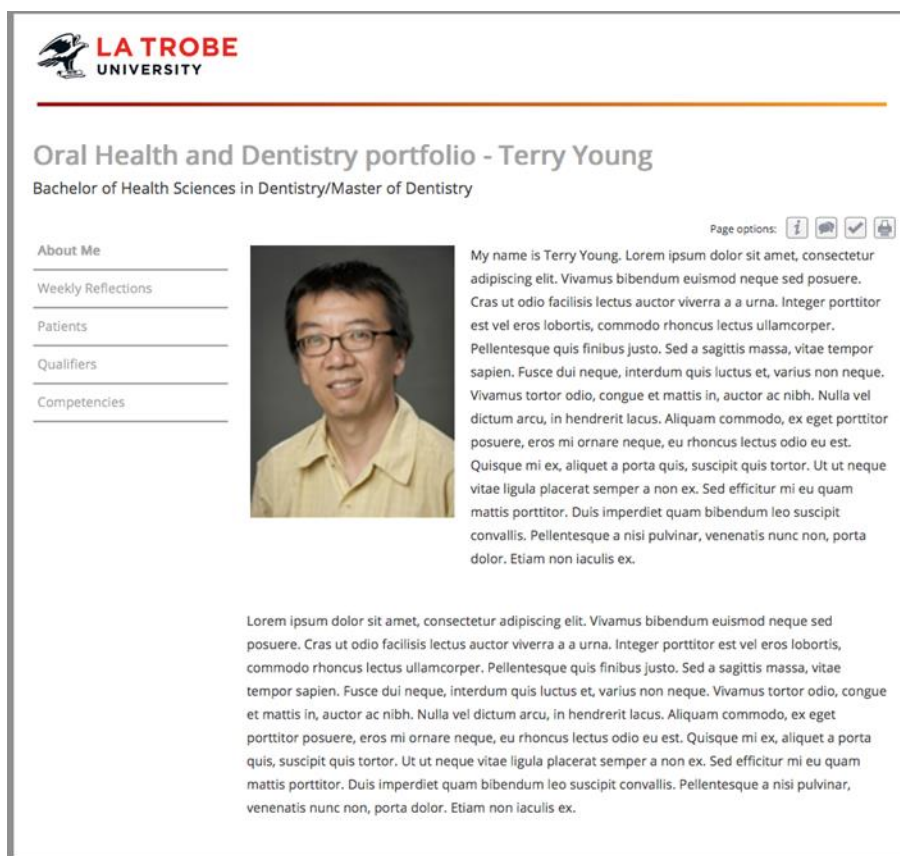






Figure 1: Portfolio example.



Oral Health and Dentistry portfolio - Terry Young

Bachelor of Health Sciences in Dentistry/Master of Dentistry

Page options:   

Below is a list of the competency assessments I have successfully completed.

About Me


Weekly Reflections

Patients

Qualifiers

Competencies

Successfully completed competencies

Assessor Field 

- ☒ Medical, dental and social history
- ☐ Extra/intra oral inspection
- ☒ Hard tissue examination and charting
- ☒ Bleeding Index
- ☐ Dental biofilm index
- ☒ Periodontal charting
- ☒ Radiographs bitewing
- ☐ Radiographs peri-apical radiograph
- ☐ Information, instruction, advice and behavioural change
- ☐ Fissure sealant/protection
- ☐ Concentrated fluoride application
- ☒ Topical fluoride with trays
- ☐ Local anaesthesia - infiltration (maxilla, mandible, palatal)
- ☐ Local anaesthesia - mandibular block
- ☐ Supragingival debridement with hand-instruments
- ☐ Subgingival debridement
- ☐ Prophylaxis/selective polishing and stain removal
- ☐ Single surface adhesive restoration posterior permanent tooth
- ☐ Single-surface adhesive restoration anterior permanent tooth
- ☐ Multi-surface adhesive restoration permanent tooth
- ☐ Amalgam restoration permanent or deciduous tooth
- ☐ Vital pulpotomy in deciduous tooth
- ☐ Stainless steel crown
- ☐ Exodontia deciduous tooth
- ☐ Cuspal overlap permanent tooth

Figure 2: Example list of successfully completed competencies.

Radiograph 2 - URL 87654

Date
12 November 2015

Upload Radiograph
Use add evidence to attach your radiograph
Use add evidence to attach your radiograph

Type of radiograph
☒ Bitewing

Target
Describe targeted tooth/region
(pre)molars 1/4

Indication for radiograph
Describe the reason the radiograph was taken
recurrent caries 1.7 en 3.6

Overlap
☒ Yes
☐ No

Evidence

 Partially evidenced

 [Radiograph 1](#)

Added: 12 November 2015 11:01:22

https://v3.pebblepad.com.au/atlas/latrobe/Viewer/Submission/View/345



Radiograph 1

Description



[Open file](#)
Please note: When opening a file results may vary d

Figure 3: Example of Radiograph Worksheet and submitted radiograph.

The screenshot shows the 'Pebble+' interface for a 'Ron Knevel communication video' worksheet. It includes instructions for uploading a video (max 10 minutes, .mp4, 300Mb), attaching a consent form, and a checklist of recorded items. The recorded items are all checked, and the quality recording criteria are all unchecked. The interface is dark-themed with a sidebar on the right containing icons for information, chat, progress, and other functions.

Ron Knevel communication video

Upload your communication video (maximum 10 minutes, format .mp4, make sure the size of your movie doesn't exceed 300Mb).

Attach (scanned) consent form and approval patient/Bendigo Health. 1

Clear scan, appropriate lay-out/orientation

Recorded items (all items need to be recorded) Assessor Field

- ☒ introduction to treatment
- ☒ fragment of introduction reason for taking medical, dental and social history
- ☒ explanation of treatment and planning for the session
- ☒ relevant explanation of disease and role of dental biofilm related to oral health risks
- ☒ demonstration and practice of oral hygiene materials and methods
- ☒ motivational interviewing strategy, behavioural change management and support, collaborative decision making

Assessed: 12/11/2015 12:19 by Ronald Knevel

Quality recording (all criteria need to be met) Assessor Field

- ☐ sound/conversation audible, recognizable
- ☐ face patient/operator clearly visible
- ☐ demonstration and instruction, explanation of use of tools and aids clearly visible

Figure 4: Example of Communication Video worksheet.

Data collection and reporting

Moving the recording of student patient records, evaluations and feedback to an online digital format allowed the opportunity to capture and collate this data into online Data Reports.

These reports are automatically created by the ATLAS system and viewable in real time by academic coordinators. Collating the data was previously not practical. The reporting functions greatly enhance the managing and monitoring of group or individual student progress.

The reports are able to highlight the students who are not progressing as well as they should be and those who may need additional support. Having insight into the performance of the students and tracking their progress by having real time access to the progression / completion pages has been valuable (Figure 5 & Figure 6). We have been able to adopt a proactive approach by inviting students to progression meetings when their achievements are below average. This included discussion about specific clinical learning experiences recorded in the portfolio. This intervention informs a personal remedial teaching program for individual students.

The reports allow academic coordinators to review and audit the quality of feedback that is being given to students. Monitoring feedback from the clinical educators provided insight in adherence of clinical educators to educational/academic guidelines and informed the need for calibration or additional training sessions for educators.

Having these records open and transparent in the portfolio has improved the dialog amongst our clinical educators.

The reports generated by the software are very limited and the data sets are very extensive. This has been a barrier to interpret them effectively and we will investigate mechanisms to better analyse this data for more meaningful interpretation and critique.

It is proposed in the future, these reports will indicate skills and competencies that students are commonly having difficulty with and will inform long term planning of curriculum.

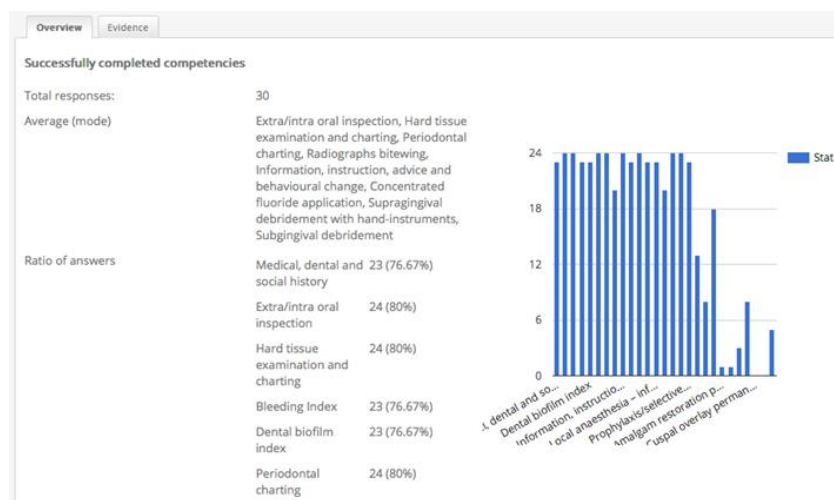


Figure 5: Example report of successfully completed competencies.

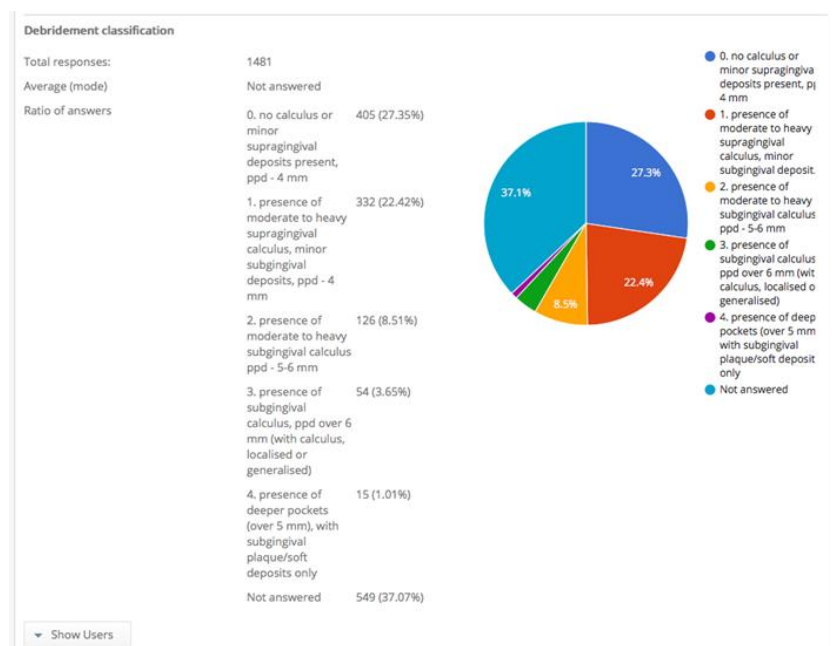


Figure 6: Example report of Patient record criteria summary.

Results

The implementation resulted in establishing a 360 degree feedback framework. Clinical educators were aware of transparency of feedback and improved the quality of their feedback. They were encouraged to write feedback during the sessions (as they went) and not at the end of the treatment. This resulted in immediate meaningful open communication. 360 degree feedback gave a realistic and objective overview of the student's progress for all concerned.

An effective reflective framework was established. The feedback obtained from Clinical Educators about the new system indicated that they appreciated the information from the students. They gained insight into individual student learning and understanding through the reflective diaries. They were enthusiastic about the radiographic portfolio and progression reports.

Dialogue between clinical teachers and between academics and clinical teachers improved. The online records provided an open space to refer, discuss and compare individual and group performance, which had been difficult with a paper-based system. This led to an improvement in the tracking and monitoring of students. Clinical educators had the ability to monitor clinic sessions in real time, and provide feedback on completion of clinical patient records.

Table1: Clinical Educator experience survey results (N=10).

Survey Question	Agree or Strongly agree
Completing feedback via the clinical record/digital logbook is important.	90%
PebblePad has improved transparency between the feedback from different clinical educators.	80%
PebblePad has improved transparency between the feedback from different clinical educators.	80%

Students were very positive about using this technology from the beginning. Once introduced to the framework, students accepted the technology using both PCs and mobile devices. Students liked the feedback videos and demonstrations that were attached to specific logbook templates. This enthusiasm resulted in requests from students to add more functionality to PebblePad and requests for it to be used for other assignment submissions.

Table 2: Student experience survey results (N=18).

Survey Question	Agree or Strongly agree
The digital logbook in PebblePad benefits my learning.	83%
The digital logbook has improved tracking of my performance in clinic.	94%
The competency criteria templates are a useful tool to gain insight in my performance.	94%

We have learnt that this implementation has resulted in better support of student learning using an effective 360 degree feedback and reflection framework.

Lessons learnt

Academic perspective

The transparency of the system exposed omissions in clinical educators' adherence to specific practical guidelines. This was often argued as due to 'lack of time'. However, in the analogue paper-based system the same elements were required but were not easily monitored. This new system now provides insight into the degree of completion of clinical assessment feedback by the clinical educators. We are now able to plan additional training (didactical) or profession specific workshops to improve our level of teaching (calibration).

Clinical educator engagement

Initially, hands-on support for the clinical educators on location is necessary. They need to feel supported with a radically new system. This should include the availability of a local 'trouble shooter' to help the teachers in embrace the system.

At the beginning of the implementation, the clinical educators should be included in a discussion of anticipated workflow. Their feedback should be encouraged and embraced where possible. This facilitates stakeholder ownership and improves the likelihood of success and engagement.

On reflection after the pilot our academics had the following feedback:

My biggest challenge:

Perception of time investment for providing feedback — is it the use of the technology that requires more time or is it our system of feedback. In the past our clinical educators didn't complain about the time consuming aspect of the feedback, so it must be the technology factor. How can this be improved, what do we need to do to make them feel supported by the system where as now they feel the system is distracting them from focusing on working with the students. Negative attitude towards the system? Or towards technology? Students embraced it, teachers say it is costing more time? Tension??

(Academic coordinator)

The feedback processes to students will need to be reviewed for improvement.

Student engagement

We found students adopted the system easily. This may have been a consequence of an effective student introduction and an opportunity to have hands-on practice. Their learning was supported by contextual videos which students also used later for reference.

Summary

- This is a time consuming process which requires input from every stakeholder at every stage. It is important to demonstrate that their feedback and issues are taken seriously. Keep them informed about any changes made to the system or the procedures based on their feedback.

- Testing at clinical sites is critical. IT infrastructure should work flawlessly — we had issues with WiFi access resulting in initial frustration for all users.
- A review and evaluation of this initial implementation is important in order to improve the efficiencies and quality of output.
- All stakeholders were highly engaged as we identified the value of this framework to support:
 - individual academic staff teaching objectives,
 - clinical educator teaching needs, and
 - student learning progress.

Development perspective

- The Process Analysis was critical to the successful design and implementation. This entails carefully articulating process steps, including the physical user requirements, and clearly identifying the rationale and intended outcomes. This analysis will inform and influence the design and user experience.
 - How will the student interact, will it be logical and valued?
 - How will the Assessors evaluate in the most efficient manner possible?
 - How will academic coordinators monitor the assessments?
 - Are the reports meaningful and is the data easy to interrogate?
- Academic Coordinators must own the project and implementation. Invest in the partnership and ensure client ownership. Expect low confidence at first and encourage brave ideas. Practical design will rule in the end.

Conclusions

Overall this implementation has far exceeded our original plans of simply replacing a paper-based system. It has enabled us to engage all stakeholders in the teaching and learning process. The open nature of the records has made all users far more accountable for the records, reflections and feedback. The rich data sets derived are opportunities to inform teaching practice and verify student cohort performance. They have helped to identify learning goals and monitor student progress (Duque, 2003). All stakeholders have been inspired to pursue further possibilities with the PebblePad portfolio system.

Outcomes

This project has presented many positives outcomes for our students. They can effectively record and reflect on the experience in a clinical setting and receive real-time feedback. This method contributes to the 'feedback loop' integral to formative assessment (Cambridge, 2001). This has identified competencies they have gained and helps them plan and address weaknesses informed by effective feedback. They are able record evidence of progress toward competency of professional standards. These are records of their learning journey with personal reflections and valid assessor insight of their performance. Students have confidence that the feedback is valid, of a peer reviewed standard and informed by quality assurance mechanisms. The use of portfolios has influenced student learning through the

construction process and timely feedback from teaching staff (Lynch & Purnawarman, 2004).

The 360 degree feedback option prepares graduates and employees for a changing and ever more competitive world. They can evaluate their professional profile/identity based on information and feedback from all their professional relationships (patients, colleagues, employers and other organisations).

Recommendations

In future, we will be expanding the program to our Regional clinics and hope to improve it to include more extensive training for our clinical educators. This will incorporate changes to our workflows to reduce time to give feedback. We will need to review the workflow process of clinical assessment to streamline processes including administration workloads. There is a need to create additional videos for students and educators to support review/feedback of skills.

There is considerable opportunity to investigate more effective methods to analyze the data sets to provide better monitoring tools.

These recommendations will be used to drive change in the curriculum and to improve academic support to students.

References

- Amsellem-Ouazana, D., van Pee, D., & Godin, V. (2006). Use of portfolios as a learning and assessment tool in a surgical practical session of urology during undergraduate medical training. *Medical Teacher*, 28(4), 356–359.
- Cambridge, B. L. (2001). Electronic portfolios as knowledge builders. In B. L. Cambridge, S. Kahn, D. P. Tompkins, & K. B. Yancey (Eds.), *Electronic portfolios: Emerging practices in student, faculty, and institutional learning* (pp. 1–11). Washington, DC: American Association for Higher Education.
- Duque, G. (2003). Web-based evaluation of medical clerkships: A new approach to immediacy and efficacy of feedback and assessment. *Medical Teacher*, 25(5), 510–514.
- Kolb, D. A. (1998). Experiential learning: From discourse model to conversation. *Lifelong Learning in Europe*, 3(3), 148–154.
- Lynch, L. L., & Purnawarman, P. (2004). Electronic portfolio assessments in US educational and instructional technology programs: Are they supporting teacher education? *TechTrends*, 48(1), 50–56.

Biography

Terry Young

Terry Young is an educational designer at La Trobe University. He has been involved in ePortfolio development for the last five years in the vocational and higher education sectors.