

Chapter 2

Striving for Sustainability: ePortfolio Pedagogy in Australian Higher Education

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Abstract The Queensland University of Technology Student ePortfolio program is a core-funded, fully supported program available to all students since implementation across the institution, in 2004. After graduation, alumni maintain lifetime access to their ePortfolios with access to support resources. Academics are supported to embed the Student ePortfolio program to enhance student learning outcomes and to meet institutional learning and teaching goals. This chapter explores the maturing of said Student ePortfolio program, in particular as a critical reflective pedagogy, through professional narrative based on use cases. The narrative illustrates the diverse nature of ePortfolios for real world learning at Queensland University of Technology. The lived experience of teaching staff and students using ePortfolios to meet expected learning outcomes is detailed through a series of topic areas: lecturers' conceptualisations of ePortfolios; clarity of purpose to encourage student engagement; benefits to students and staff of this creative approach to learning; constraints and consequences of ePortfolio pedagogy; crucial aspects of supporting ePortfolio engagement; identification of factors that contribute to the sustainability of an ePortfolio approach. These issues are discussed based on user experience, broader ePortfolio community experiences and issues, and reference to the literature on ePortfolios. Strategies and solutions identified inform the ongoing development of an ePortfolio approach to learning and teaching, for the enhancement of student learning outcomes and academic learning and teaching goals.

Introduction

The purpose of this chapter is to inform sustainable, regenerative ePortfolio learning approaches in Australian higher education and to contribute to this conversation internationally. Through professional narrative the context of ePortfolio development and maturity at Queensland University of Technology (QUT) is detailed in scenario form with commonly recognised issues, barriers and enablers discussed in terms of

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user-experience and reference to literature. The cases cited detail the embedding of the QUT Student ePortfolio (QSeP) across the Science and Engineering Faculty and the Faculties of Law and of Health. The examples provide insight into challenges and opportunities, and suggest factors critical to sustainability of the program, giving a sense of the purpose for engaging students in ePortfolio creation and curation. The chapter investigates recognised critical success factors for sustained embedding of critical reflective pedagogy through ePortfolio pedagogy at QUT. Through an overview of ePortfolio practice at QUT across several discipline areas, issues raised, barriers encountered and enabling strategies which have been developed to support ePortfolio engagement at QUT are outlined. It is acknowledged that strategies which serve to mitigate difficulties in one area may not be effective in others. Nonetheless, examples and discussion of them will contribute to successful ePortfolio engagement across education sectors and discipline areas to the benefit of academics, teaching staff and students.

Method

Discussion of ePortfolio use has been developed in this chapter as a professional narrative (Fook, 2012) using phenomenological analysis to draw upon and make meaning of the lived experience of stakeholders across 11 years of ePortfolio activity at QUT (Polkinghorne, 1998). The action research cycle of planning, acting and observing, and reflecting (Kemmis & McTaggart, 1988) guides evaluation and development of the QSeP. It is the action research approach that gives insight into the lived experience of those engaging in ePortfolio pedagogy. The body of data collected across stakeholder groups, such as students, administrators, executive and teaching staff, is crucial to the evaluation and development of the program. Reason and Bradbury (2001) note the role of narrative analysis in action research as it uses a mixed data collection method to maximise opportunity to gather user feedback within the QUT environment, and seeks to minimise ‘survey stress’ for staff and students. Feedback can be drawn from touch points familiar to students, such as the Information Technology (IT) Helpdesk, email and telephone contact, and during lectures, support sessions, consultations and workshops. Feedback typically consists of requests for assistance, complaints, suggestions, ideas, and appreciation. Surveys are used only when specific data is required to inform key tasks, for example, technology enhancement. The mixed method approach to collecting data has led to an effective evaluation cycle which bases decision making on the user experience of all stakeholders in ePortfolio engagement.

The QUT Student ePortfolio Program

The QSeP is an award-winning, university-wide approach to learning and professional development for students and alumni. Planning for QSeP began in 2001 when the then DVC – Technology, Information and Learning Support, brought from an international symposium a desire to provide QUT students with greater evidence of their achievements than could be presented in an academic transcript. There was strong senior leadership for the venture with close engagement between DVCs, Assistant Deans Teaching and Learning, Manager – Careers and Employment and technical developers during the design and development phase. It was, and remains, formally supported by institutional policy detailed in the QUT Manual of Policies and Procedures (MOPP). Use of QSeP is governed by the QUT IT Rules which govern all use of IT by QUT staff, students and alumni.

The program was implemented across the university as a project in the execution phase, in 2004. The ePortfolio online tool provides an electronic space designed around the QUT graduate employability skills. This provides students with the space to create and curate evidence of learning and storage space to upload and store files of their learning. This tool was built within existing QUT systems familiar to students and staff. The space is student-owned and managed and remains fully supported for students after graduation through alumni access. Initial interest in QSeP was aroused through new technology and the idea of ePortfolio as product. It was widely perceived as a collection (or archive) of experiences, achievements and artefacts, developed through critical reflection. Despite early emphasis on use of the ‘technology’, it was quickly recognised that the process of critical reflection, required to create and curate the ePortfolio, presented students and academics with a challenge at least as great as the technology. From the outset, QSeP has been centrally supported by a team comprising both technical and pedagogic expertise as well as senior leadership. QSeP is available to all students to use independently and to all academic and teaching staff to use in learning and teaching, and assessment activities.

Initial drivers for developing QSeP were founded on the belief that student-owned, student-centred reflective learning spaces could add value for students by supporting them to make connections between personal experiences, formal and informal learning and professional aspirations and goals. It was not conceived at this early point, that the ePortfolio could or would be used to support learning and teaching in the formal sense, such as for assessment or as a mandated or required activity. Since 2004, the understanding of an ePortfolio approach has matured as purposeful embedding within units and courses of study has increased. The QSeP project was transitioned to a core university-wide service in 2011. The ePortfolio at QUT is understood as pedagogy and as a program comprising the process of critical reflection or critical self-enquiry and the online technology which supports development of the ePortfolio as a personal learning space, product or entity. The term ‘ePortfolio’ conjures many different understandings and it remains a challenge, based on current ePortfolio conversations, to foster shared understanding between

learning and teaching practitioners across the institution, nationally and internationally.

Uptake of QSeP has been consistent since its inception with early adopters sharing practice and inspiring colleagues to adopt the ePortfolio approach. Currently, QSeP is used widely across the institution, both independently and as embedded critical reflective pedagogy in single units, degree courses, higher degree research and extra-curricular programs, where the approach helps students maximise learning opportunities. It underpins learning, teaching and assessment requirements in many health disciplines including social work, nursing, public health, podiatry and biomedical sciences; information management; law and justice; engineering; business and education, supporting undergraduate, postgraduate and higher degree research students. There are approximately 10,000 new ePortfolios created each year and more than 45,000 active alumni ePortfolios.

ePortfolios in Australian Higher Education – A First Look

In 2007–2008, the Australian ePortfolio project, led by QUT and funded by the then Australian Learning and Teaching Council (ALTC), found that ‘ePortfolios’ were being discussed in all Australian and New Zealand universities. There was a “high level of interest in the use of ePortfolios...to enhance student learning outcomes and help students become confident graduates with a strong sense of professional identity and the capacity to meet recruitment and career challenges” (Hallam et al., 2008, p iii). However, ePortfolio implementation activity was fragmented with only one university-wide ePortfolio approach in Australia, and that was at QUT. In 2006, the New Zealand Tertiary Education Commission developed the Mahara open source ePortfolio, promoting life-long learning and providing students with the tools to demonstrate their skills and abilities to different audiences. Mahara remains freely available across New Zealand educational sectors and has been widely adopted within Australia and internationally (Mahara, 2010). At the time of the Australian ePortfolio Project, Australia was considered to be “in the early stages of ePortfolio practice” compared to practice in the UK, Netherlands and the USA (Hallam et al., 2008, pp iii & 17). Since that time, implementation of ePortfolios for learning has continued to grow across Australian higher education and the notion of ePortfolio learning has continued to expand in the UK, Europe and the USA. There is an extensive body of literature, including dedicated journals, based on the use of ePortfolios for learning in higher education. Research projects, ePortfolio implementations, discipline based ePortfolio projects are well documented in the literature and generally include the barriers, issues, challenges and keys to success of the undertaking. Discussion of these elements has been evident in the ePortfolio literature since the early years of activity in Australian higher education.

ePortfolio Engagement at QUT – Issues, Barriers and Enablers

Science and Engineering Faculty (SEF) The School of Information Systems, a department of the Science and Engineering Faculty and previously within the Faculty of Information Technology, has been engaged with the student ePortfolio for more than 12 years, since the development phase of the QUT ePortfolio. Final-semester students in the Master of Information Technology (Library and Information Studies) course were invited to participate in the pilot testing phase of the QUT Student ePortfolio project in 2001. Students, who chose to participate, used QSeP to complete existing document-based portfolio assessment, which was the major assessment item in this Professional Practice unit. Even at this pilot testing stage of the QSeP technology, it was understood that students would be unlikely to engage with the ePortfolio if their work was not being assessed. This was the reason for ‘attaching’ this testing activity to a unit where focused critical reflection was an existing practice for the unit and the professional practice portfolio was an assessment requirement. The existing ePortfolio assessment was a graded assessment and remained so for a few semesters after introducing QSeP. It has since changed to a Pass/Fail assessment which must be completed to a specified standard before students can graduate from this course. Critical reflection was already a well-supported element of all assessments in the core units of the degree program, so the use of ePortfolio did not require course redesign and was embedded purposefully into existing learning activities. This was the main reason together with enthusiasm of the course coordinator for inviting this cohort to test the newly developed QSeP technology.

Students reflected on their learning within the course and made connections to their life experience, work placements, prior study to provide evidence of their capacity to perform as an information professional in their chosen field. Artefacts, typically work samples and supervisor feedback often formed the basis for reflection and added extra weight to self-assessed evidence. The portfolio assessment in this unit specified particular types of evidence and artefacts that students were expected to include. It was expected to be of a quality that would convey to a prospective employer, a picture of the ‘complete professional’. The course coordinator realised the potential for ePortfolio to effectively engage students to develop reflective habits and to meet the challenge of employment in the online environment. The purpose of engagement was clear to these students who fully expected to use the ePortfolio product to show prospective employers. One of the main issues at this stage was the lack of functionality which precluded sharing the online ePortfolio beyond the QUT firewalls. This was a significant disincentive to student engagement. At this early stage, the ePortfolio was not made available for life so these students did not have the benefit of sustained access to the ePortfolio beyond graduation. By 2008, only 4 years after QSeP implementation, continued lifetime access was realised to be a significant factor for engagement and the ePortfolio service was extended to alumni,

for life. Lifelong access to the ePortfolio is now considered to be a critical success factor for QSeP engagement at QUT. External access was achieved some years later.

The early cohorts were closely supported through practical lab sessions to 'learn the tool'. QSeP has continued to be used to support assessment for this unit to the present day, with online and animated guides providing most support and practical sessions reduced to requested drop in sessions. Most recently, students in this course, now known as the Master of Information Science (Library and Information Practice), continue to use QSeP for assessment of the Professional Practice unit. The Professional Practice unit now runs as a course-long unit. These students typically use a range of software to present their ePortfolios. This encourages exploration of technologies which support critical reflection and allows students to individualise the ePortfolio for presentation. They are required to submit from within their QSeP technology, as this streamlines assessment marking. The ePortfolio requirement has remained embedded despite movement of teaching staff over the years. In this particular instance, it is largely due to the purposeful nature of the tasks and the foundational development of the ePortfolio assessment tasks across the first few years. Students in this cohort come to expect continued recognition of their ePortfolio development by The Australian Library and Information Association, the main industry association for information professionals, which uses an ePortfolio approach to continuing professional development within the association hierarchy of membership.

QSeP has also been used in the Bachelor of Information Technology, large first year core unit, to engage students to more fully understand the different streams and elements of the Information Technology profession. Students typically held a very narrow view of the profession as being all about "games design". Individual academics recognised the capacity of critical reflection and building an ePortfolio to help students understand their chosen profession. Students were required to collect job related information for the type of position they were interested in; to speak with guest lecturers employed in the IT field and gather information about the real nature of the work; to carry out a personal skills audit and discuss strengths and weaknesses with fellow students; plan to develop new skills or improve existing skills. Such activities helped first year students appreciate the real nature of working in the IT field. The program encouraged first year students to think about their professional goals and explore their chosen industry, reflecting on their current skills and on the skills they will need to develop further. There was an improvement in retention in the Bachelor of IT after the implementation of these ePortfolio assessments. This particular embedded use of QSeP was due to the vision and drive of one academic and although successful over multiple iterations, has been discontinuous over time depending on staff turnover. The need to carefully and deliberately support critical reflection in this unit caused workload issues as did the high number of student queries related to critical reflection and the purpose of using the ePortfolio. Butler (2007) notes perception of increased workload as a prevalent barrier to using ePortfolios. The issues of workload and need for reflective writing coaching were mitigated by training the tutors to more closely support students in reflective writing and to ensure all students were introduced to the technology within a compulsory

unit tutorial session. It had been mistakenly assumed that, being 'IT students', they would automatically be comfortable with the technology. The tutors reported that this strategy worked well for this unit and the practice continued for several semesters until the faculty closure and subsequent restructure led to the loss of key experienced teaching staff and the ePortfolio approach to learning in this unit was lost.

Over the years there have been episodes of interest in the possible embedding of ePortfolio to support Bachelor of Engineering students to enhance learning in project and work integrated learning (WiL) units of study. Several consultations with senior teaching staff took place. In 2010, there was a determined effort to recruit final year engineering project students to create their professional ePortfolio; to build a body of evidence addressing professional/industry based engineering standards. There are several similar, but distinct, engineering standards worldwide and, as experience suggests that engineering students tend to look for work outside Australia, there was perceived benefit for students to develop the ePortfolio to aid mobility across the international workforce. However, staff movements and the lack of agreement on a single industry-based set of skills and competencies, hampered the purposeful embedding of ePortfolio pedagogy for engineering students at that time. The ePortfolio team did, however, work closely with an engineering student who developed his ePortfolio to evidence recognised employability skills. He also worked with the team to develop a video, telling fellow students of the insights he had realised as a result of critically reflecting on learning. He greatly valued the increased confidence the process had brought him and felt it improved his prospects of finding employment.

Recently, the Bachelor of Engineering course has been redeveloped and an ePortfolio or critical reflective component has been written into the course outline. Course-wide embedding of ePortfolio achieves best practice principles for student engagement, meeting known expectations from past students who felt it was crucial to 'start early in my course' so they could better manage their learning pathways. ePortfolio pedagogy will underpin the work integrated elements of the course and will be assessed at key points across the course to demonstrate student development of employability and professional engineering skills and competencies. Jenkins (2012) found that when using critical reflection and professional narrative with engineering students it is necessary to structure such reflective elements. This has been found critical in all discipline areas across QUT and supports the use of 'skill sets' to enable deep learning. Drivers for this latest course-wide implementation include currently low rates of graduate recruitment in Australia, the QUT Blueprint and Real World Learning Vision statements (QUT, 2014) which promote work integrated learning (WiL) opportunities for all students, and the enthusiasm and vision of teaching staff. Alignment of ePortfolio pedagogy with these broader institutional initiatives is considered best practice at QUT and important for moving ePortfolio practice beyond sustainability. However, senior leadership awareness of QSeP and a supportive institutional culture which fosters the ground swell of enthusiasm around ePortfolio pedagogy are considered crucial to achieving a regenerative ePortfolio program.

Faculty of Law QSeP has been embedded for some years into three undergraduate law units in the Bachelor of Laws (LLB), Principles of Equity; Trusts and Virtual Law Placement, to encourage and support students to reflect on and document their skills development, plan for future careers, take responsibility for future learning and development, and to synthesise their learning by making links to theory and practice across the course. The goal was to enable students to develop insight by fostering reflective practice and building student confidence and to help them develop as professionals in the workplace. Students were required to reflect on specific skills related tasks such as drafting client legal memoranda or undertaking specific legal research tasks. Students needed to make judgements about their expertise as evidenced by the work sample (artefact) and discuss plans to improve skills; talk about any issues or challenges of the type of work undertaken; discuss expectations of doing the work in a 'real' work placement. These students had the opportunity to submit their reflective writing for feedback to help them develop the critical nature of their reflections; to make connections to formal theories and to work experiences. The ePortfolio team assessed and provided feedback to guide students in reflective writing. The depth of reflection typically improved over time for these students as they were using the feedback to develop more targeted and thoughtful evidence of learning. During this time the unit coordinator developed specific assessment criteria for marking the final ePortfolios. The ePortfolio approach embedded in these units matured across several years and exemplifies best practice in pedagogy development at QUT.

QUT is committed to increasing the number of opportunities for students to engage in WiL opportunities and the Virtual Law Placement was well-received by students. Choy (2009) found that focused critical reflection must be a requirement within curriculum design in order to achieve transformational learning in work placement settings. While lecturers have different motivations for wanting to embed a critical reflective approach to learning and teaching in their units, they have a common desire to add value to existing assessment tasks and WiL opportunities which provide students with a strong base for engaging in critical reflection and ePortfolio, where the purpose of engagement is clear. "Clarity of purpose" is crucial for student engagement (Conole, de Laat, Dillon, & Darby, 2008). The individual academic responsible for developing the ePortfolio in these units is now a senior member of staff and currently involved in the course wide implementation of QSeP, across the LLB. From 2015, ePortfolio pedagogy is embedded from first year and introduced in first semester core units of study. These are large units of more than 900 students and assessment workload issues are expected. This gives a valuable opportunity to explore the use of peer review for fostering critical reflection and managing assessment feedback. Engaging in peer review and collaboration during ePortfolio development enhances the social learning aspect which is central to effective learning opportunities (Barbera, 2009; van Aalst & Chan, 2007; Zubizarreta, 2009). Peer and instructor feedback is crucial to move reflection from description to deeper analysis. It is hoped peer review strategies can be successfully implemented to foster transformational learning and mitigate workload issues.

Similarly within the School of Justice, QSeP has been embedded into the final year Professional Placement unit to support students to develop professional identity and make connections between learning across the course and personal and professional goals. It is hoped that through reflection on the profession and their professional identity, QUT Law and Justice graduates will be resilient and closely connected to the industry which currently experiences high attrition rates from graduates in the early years after graduation. At Curtin University, researchers noted increased career awareness, and increased engagement in 'future-oriented thinking' among students engaged in creating their iFolio through reflecting on their learning (Blom, Rowley, Bennett, Hitchcock, and Dunbar-Hall 2014). Smith, Sobolewska & Smith, (2014) found that undertaking a dedicated portfolio module, within a study program, increased the percentage of students who identified themselves strongly with their chosen profession, from 61 % to 73 %. Interestingly, they found it also had a beneficial effect on student identity, increasing the number of students expressing a strong student identity from 65 % to 83 %. Findings such as these suggest the complex, layered nature of the impact of critical reflection on student learning and development.

Faculty of Health There has been widespread use of QSeP within the Faculty of Health over the years. The Bachelor of Nursing has a very strong clinical practice focus with students undertaking professional practice units and clinical placements across the course. Reflection on practice is crucial to development in health care disciplines as patient safety depends on personal and professional awareness of capacity to practice. Traditionally, nursing students recorded clinical reflections on paper and it is perhaps not surprising that the nursing discipline was an early adopter of QSeP. On graduation, nursing students are required to evidence their capacity to meet the Australian Nursing and Midwifery Competencies. The Bachelor of Nursing academics were quick to realise the potential of changing from a paper based to an online approach. The Bachelor of Nursing was the first course to request a professional competencies 'skill set' be built into QSeP to provide a focus for reflection and structure for presentation. Feedback from students and academics at QUT suggests frameworks help students develop deeper understanding of their learning and experiences. A 'skill set' in QSeP means an industry-based discipline specific set of standards or competencies. Some professions such as teaching and nursing mandate ongoing engagement with these discipline standards through regular re-accreditation or registration. The Australian Nursing and Midwifery Council (ANMC) were in favour of the Nursing Competencies being built into the technology in 2004. User feedback on the use of the 'skill set' suggested they provided structure for students to manage, organise and curate content; provided guidance to viewers of the ePortfolio and most importantly supported critical reflection for students' capacity to evidence the professional requirements of their course. Based on the satisfaction with the 'skill set' for nursing students requests from other disciplines followed. There are now more than 15 discipline specific professional 'skill sets' built into the student ePortfolio. Students have access to relevant 'skill sets' based on their course enrolment information which

ensures students have access only to the professional standards and competencies relevant to them. 'Skill sets' are updated when required to align with industry reviews and changes to existing competencies and practice standards.

In 2007, the then Bachelor of Nursing course coordinator embedded the ePortfolio into the fourth clinical placement unit, which was in the third year of the course. She was aiming to enhance the standard of critical reflection which she deemed unacceptable in students so close to entering the profession as beginning nurses. These students received targeted coaching to help them focus and develop critical reflection and reflective writing. They were given practical hands-on training to learn the technology and were able to develop their ePortfolios during scheduled compulsory course tutorial sessions. It was labour intensive for the ePortfolio support team but worked well for these students. For several semesters, this model supported clinical reflective writing and the course co-ordinator saw an appreciable improvement in the quality of clinical reflections. There was a steady redevelopment of support resources based on student requests for exemplars and specific point of need assistance with the technology. A serious barrier for this cohort was the lack of functionality in the technology, which excluded clinical preceptors [at this time] from accessing the student ePortfolio online tool. The technology could be released only to people who had a formal association with QUT, meaning they have a QUT email account. Honey, Doherty, Marshall and McIlwain (2010), found the lack of access for preceptors to be a critical issue and one of several which led to discontinuance of the nursing ePortfolio in their study. This lack of required functionality, together with staff movement and a preference to support the reflective writing completely 'within-discipline', led to QSeP being omitted from the course. In 2013, funding enabled development of the external release functionality as well as feedback function to enhance the assessment process. Both of these long-awaited developments have been well-received by academics and particularly by students who can now release their online ePortfolios to external audiences such as prospective employers. The capacity of QSeP, to once again support students in the Bachelor of Nursing, is currently under review.

The Master of Nursing Science (Nurse Practitioner) course has been using QSeP to underpin the major assessment item in the course for more than 6 years, with seamless handover from the outgoing to newly-appointed course coordinator, during that time. These students develop their professional practice portfolios to evidence their capacity to practice as stated in the Nurse Practitioner Standards for Practice. The recently created 'feedback' form was developed to meet user needs and has been successfully trialled by the teaching staff in this course. It supports students' needs, as they require ongoing feedback across the course to help them develop deep reflection with strong connections between clinical practice and the formal learning in the course. Teaching staff are now able to leave feedback within individual ePortfolios enabling students to quickly respond to the suggestions for developing more-critical reflection on practice. This functionality has been well-received and further innovations are planned as the use of QSeP in the nurse practitioner course has matured. It has developed purposefully and with the close

collaboration of students and teaching staff over time. It was the first use-case at QUT to request exemplar ePortfolios. Exemplars guide students to the required structure for the ePortfolio, thereby minimising student stress regarding the design of the ePortfolio (which is not the core goal) and also simplifying the assessment marking load by standardising the ePortfolio collections. James, McInnis & Devlin (2002) note the value of exemplars in managing large cohort workloads. Within two semesters of the first exemplar being developed, academics and students from other disciplines were requesting exemplars to help understand and visualise the structure of the ePortfolio for different purposes and also to inform content development. Feedback from staff and students suggests exemplars are one of the most popular and directly educative support resources developed to date.

In 2010, and based on the experience of colleagues in the health sciences the course coordinators of the Bachelor of Social Work and the Master of Social Work embedded QSeP and critical reflective pedagogy to help students develop the skills to best meet the demands of a competitive employment environment. Students were introduced to the ePortfolio early in the course and were expected to collect work samples and develop evidence of their skills development related to the Australian Association of Social Workers (AASW) practice standards across their units of study. At several touch points across the course the ePortfolio supported assessment tasks. It was envisaged that students would build a useful body of evidence to help them meet work placements, job applications, recruitment processes, scholarship applications and other purposes. The embedded ePortfolio was purposeful, closely supported through assessment tasks and students reported that the process of ePortfolio creation gave them confidence in their capacity as professionals. Nonetheless, in 2013 when the course coordinator retired, interest in continuing with the embedded ePortfolio was lost and engagement lapsed. Twelve months later an experienced ePortfolio pedagogue joined the teaching staff and QSeP was embedded into a single elective unit of study for Bachelor and Master of Social Work cohorts – the Professional Practice unit. Jasper and Fulton (2005) make the point that creating an ePortfolio requires students to link theory and practice. This is at the core of ePortfolio pedagogy at QUT as a university for the ‘real world’. QUT aims to have 60 % of students undertaking at least one WiL experience during their course of study and the Professional Practice Portfolio is the major assessment for this unit which is created and presented for assessment within QSeP. The current unit coordinator is actively researching the impact of critical reflection and ePortfolio creation on the student learning in this cohort and this promises to provide valuable information for the development of ePortfolio pedagogy. The current iteration evidences best practice, being purposeful and engaging, and has the support of the discipline industry partners, which is unique within QUT ePortfolio practice.

QSeP is purposefully embedded to support minor assessment tasks in a number of areas within the Faculty of Health: exercise science, cardiac science, biomedical laboratory skills, medical radiation science, paramedicine, public health and podiatry. Embedding in these units of study follows best practice at QUT which is to assess student engagement with critical reflection and to ensure students understand the purpose for creating and curating a body of evidence of their learning and

development for the purposes of employment, career progression, research funding and scholarships and awards. This is very valuable for students and academics alike as it combines the discipline specific learning with students' personal attributes and employability skills such as leadership, persistence, self-management, interpersonal and communication skills (Holmes, 2013). Radloff et al. (2009) noted that teaching staff may be disengaged with generic graduate employability skills, preferring to focus on discipline standards and competencies.

It is expected these cohorts will require critical reflective writing support as it is not a within-unit focus. Early trials of the ePortfolio revealed the need to provide students with instruction in reflective writing and to connect the ePortfolio with career-related outcomes (McCowan, Harper & Hauville, 2005). Members of the ePortfolio team were instrumental in conducting training sessions designed to provide students with the technical and reflective skills required to create a portfolio. The *5Rs Framework for reflection* (which is a component of the QSeP) was used to help students begin to develop reflective writing. This framework consists of Reporting, Responding, Relating, Reasoning, and Reconstructing. Frameworks such as this ask students questions and help them develop the critical nature of reflection by structuring their thoughts, enabling them to meaningfully and systematically reflect on significant experiences (Bain, Ballantyne, Mills, & Lester 2002). Training sessions also provide an opportunity to contextualise these reflective practices by demonstrating how these reflections may be applied in job-seeking activities, such as responding to selection criteria. The ePortfolio team develops reflective writing resources which assist students to make connections between their clinical evidence and their 'real world' credibility, which anchors the ePortfolio for the students as a motivating tool to help them find employment.

The Future and Sustainability

The term 'ePortfolio' is variously understood in different discipline areas and different institutions. After many years of focused ePortfolio development in higher education worldwide, there is still a sense that it may not be well understood (AAEEBL, 2015). The QUT brand is a 'University for the Real World' (<https://www.qut.edu.au/>) which challenges all academics and professional staff to aim to enhance students' capacity to meet career and employment processes and professional goals. QSeP and critical reflective practice have a role to play in this pursuit and the sustainability (and perhaps regenerative capacity of this approach to learning) may be best supported by following best practice principles evidence from experience at QUT, from the body of literature and by ensuring critical success factors continue to guide development and application of the pedagogy. At QUT, ePortfolio is promoted as critical reflective pedagogy, an approach to learning which provides opportunities for students to come away from their university learning with much more than a testamur. The previous section has suggested a range of activities which provide a basis for reflection and the creation of an online ePortfolio

to develop, document and present evidence of learning and professional development. At QUT, striving for sustainability means communicating the ePortfolio concept in context and supporting the approach in an holistic manner. The following section presents elements for sustainability.

Critical success factor (CSF) is a term for a strategy or element required for the success of an enterprise or undertaking (Rockart & Bullen, 1981). We know from experience since QSeP implementation that certain factors are critical to ePortfolio success at QUT – QSeP needs to be purposefully embedded; when used to support unit and course learning outcomes, student effort must be assessed; academics need to know they will be supported with perceptions of increased workload and negative feedback from students minimised; we need to identify and convey ‘measures’ of positive impact on students; positive and consistent senior leadership is required to support bottom up implementation and sharing of practice. The critical nature of these factors may well differ in other contexts based on institutional culture and practice. At QUT, however, experience suggests that sustainability of the QSeP program will falter if any one of the following factors cannot be met.

Practice Should Be Evidence-Based

The process of developing and maintaining an ePortfolio requires students to think critically about their skills, abilities and professional identities. The annual Australian Association of Graduate Employers Survey (AAGE, 2014) showed that employers mainly use behavioural interviews, panel interviews and reference checks when recruiting and are looking mostly for evidence of communication and teamwork skills and cultural fit with the organisation. Students who have been through the process of ePortfolio development – through critical reflection on their learning and experience – are more likely to understand their capacity and be able to meet the challenges of graduate recruitment. The QSeP team supports academics to make the connection between critical reflective assessment requirements and the world of employment and self-promotion clear for students.

These factors from the literature are recognised as best practice at QUT. They guide the use-cases which have been detailed in this chapter and are aimed for in all implementations of ePortfolio pedagogy. The program evaluation cycle ensures the body of literature and user feedback continually inform best practice. The following summary provides key best practice strategies:

- ePortfolio pedagogy must drive the technology and not the other way around
- ePortfolio should be embedded in unit/course activities as this clarifies purpose and motivates engagement
- ePortfolio should be introduced early in the course preferably Year 1 Semester 1
- ePortfolio tasks should be assessed and effort acknowledged and rewarded
- students should be able to ‘see’ where ePortfolio assessments fit within a course
- ePortfolio assessment should use a range of types e.g. peer feedback

- flexible support modes are most effective in supporting diverse cohorts
- students require structure and scaffolding to develop reflective writing skills (Brandes & Boskic, 2008; Peacock, Gordon, Murray, Morss, & Dunlop 2010).

Best practice in ePortfolio pedagogy suggests that critical reflection and ePortfolio development and curation be designed into units (preferably programs) of study. Reflection develops over time and is an iterative process in which ePortfolios should develop with the learner across a course or program of study. They should be a core assessment requirement and never seen as an add-on, as critical reflection requires support and structured teaching approaches to help students write reflectively (O'Connor, Obst, Furlong, & Hansen 2015).

Creating an ePortfolio can encourage teachers to think deeply about teaching, to acknowledge theories about their practices, and to engage in dialogues about teaching (Butler, 2007). Provision of a staff instance of ePortfolio aligns with known best practice which indicates that student engagement is more effective where teaching staff engage in ePortfolio creation; value the approach and model critical reflective behaviour (Schaub-de Jong, Schönrock-Adema, Dekker, Verkerk, & Cohen-Schotanus 2011).

Where the ePortfolio is embedded into units and courses of study at QUT, it is assessed. This rewards students for the significant time and effort required to meaningfully engage in critical reflection and with the technology and was done to avoid the difficulty of moderating grades across a diverse range of ePortfolios. In most cases, the ePortfolio assessment at QUT is Pass/Fail. In the three LLB units detailed, the ePortfolios were graded to meet student expectations. Interestingly ePortfolio for assessment is always an interest area at the annual ePortfolio Australia Forum with a workshop dedicated to the subject each year. Over the years the literature has suggested there is a perceived tension in assessing something as personal as an ePortfolio. When academics are supported to develop authentic assessment tasks which focus on critical reflective practice and evidencing learning, and to develop criterion referenced marking rubrics, there is less concern or tension around the grading of ePortfolio assessment tasks. The use of clear guidelines and frameworks to support academics to embed ePortfolio pedagogy is a recognised success factor and not unique to this activity.

At QUT, the student ePortfolio is a way of learning and teaching. It is only through carefully designed pedagogy that ePortfolios become empowering and regenerative. Delandshere and Petrosky (2010) and Thomas and Liu (2012) have shown that while ePortfolios have the potential to support critical reflection, they are not sufficient to sustain student engagement which requires collaboration and feedback to help students develop. This is one of the reasons that the student ePortfolio is now recognised as pedagogy, requiring thoughtful design and purposeful delivery.

The Planned Flexibility Support Model

The Planned Flexibility support model enables the team to respond quickly and to draw upon pedagogic, technical and management expertise to support users, in-context and at point of need. The ePortfolio team is within the eLearning Services department in the Division of Technology, Information and Learning Support and can access skills from technical developers, learning design and management. The team manager can facilitate communication with faculties and senior leadership. All users – academics, students and alumni, can access support resources for ePortfolio engagement.

The support model has developed over time, in line with user needs and underpinned by an action research method, which enables ongoing evidence-based evaluation and development (Kemmis & McTaggart, 1988). It reflects the elements of best practice as found in the ePortfolio body of literature. Academics and user groups can request contextualised, cohort specific resources; students have access to resources best suited to their learning styles; alumni can continue to access support resources which support their continuing professional development. The underpinning action research cycle ensures the support model moves beyond mere sustainability to offer a regenerative strategy which continues to effectively support ePortfolio engagement at QUT as pedagogy in context and ‘within’ technology.

Design and delivery of information and support resources is a large part of the team workload and crucial to support user engagement. Teaching staff can request ePortfolio introduction sessions within lectures, tutorials or as online modules. Students are supported to learn the technology through a range of online and animated guides as well as practical lab sessions, drop-in sessions and clinic sessions to support assessment requirements. Contextualised resources which support specific cohorts and assessment tasks have proven most effective over time. Technical development for example the ‘skill sets’ detailed in the use-cases is crucial for engagement and must be timely. Allan and Clelland (2012) note the importance of being able to provide “abundant support...wherever needed” for staff and students. They also noted the need to develop and deliver a range of support resource including examples and exemplars to guide both students and lecturers. It has been the experience at QUT that students and staff need to know that contextualised, task specific support resources can be developed and delivered and can be accessed through a range of modes such as face-to-face and online modules, animated and paper-based guides, email assistance, telephone support and that help can be delivered at the point of need.

Measuring the Impact on Student Outcomes

It is crucial to sustain a service or program such as QSeP to be able to provide evidence of the benefit to users. It is very difficult to quantify the impact of learning approaches on student outcomes and this remains an ongoing challenge for the ePortfolio team. Feedback and comments are collected here and when possible to build a collection of evidence which suggests success or benefit. Oliver (2013) notes there is “no universally accepted way of measuring graduate achievement of attributes and capabilities” (p 458). Similarly, while ePortfolio engagement can be seen to evidence graduate capabilities, employability skills, and discipline and industry specific skills and abilities, it is not possible to measure exactly nor clearly understand the impact of connected, authentic learning experiences, on student learning outcomes. Research activities, formally based or anecdotal, ought to be expected, supported and encouraged as part of ePortfolio practice.

In 2008, Knight, Hakel and Gromko found that undergraduate students who had developed ePortfolios had “significantly higher grade-point averages, credit hours earned and retention rates than a matched set of students without ePortfolios” (p 1). Hakel and Smith (2009) found that students who engaged in ePortfolio building had higher pass rates, higher GPA and higher retention rates. It is not feasible for the support team to research the benefit to students in terms of GPA or retention rates owing to research capacity within professional staff activities.

Eynon, Gambino and Torok (2014), detail an extensive range of success indicators from across 24 higher education institutions and also found a positive correlation between students’ ePortfolio creation and curation, and higher grade point average. They particularly noted higher levels of student retention and number of students graduating as ‘hard-outcomes’, measuring the success of ePortfolio practice. The cases detailed in this recent study indicate that building an ePortfolio makes learning more visible to students. They note the criticality of skilful and intentional pedagogy to achieve successful ePortfolio outcomes. At La Guardia Community College, Eynon (2009) found that student retention rates increased from 61 % to 72 % with continued ePortfolio engagement. Pass rates were higher in ePortfolio intensive courses, 79 % compared to 69 % in courses without ePortfolios and similarly retention rates were also higher, 75 % compared to 70 %. La Guardia has continued to research and report the impact of ePortfolio engagement on student outcomes noting increased retention in ePortfolio cohorts (2011–2012), 80 % compared to 62 % where no ePortfolio undertaken and likewise higher completion rates +2 % and higher pass rates +10 %, in the ePortfolio cohorts (Eynon, Gambino & Torok, 2014). This type of research serves to build understanding of the complex nature of student learning.

Institutional Support and Senior Leadership

Hallam et al. (2008) noted that ePortfolio approaches often succeed where institutions “explicitly encourage a spirit of innovation...and student-centred learning” through balanced “top-down and bottom-up” processes rather than unreconciled emerging technologies (p 53). Support by senior management is crucial to ensuring institutional strategy, policy and governance effectively support ePortfolio technology and pedagogy. This is the context in which the aforementioned processes align to enable a successful ePortfolio program.

Over the years of QSeP activity, academic and professional staff members had often requested a tool ‘like the student ePortfolio’ to support their academic and professional development. Experimental work in 2007–2009 found the student tool was not an effective technology for staff use. In 2010, based on these requests and on the evidence of positive benefit, from the literature, work began on the Academic and Professional staff ePortfolio. Consultation with the human resource department recognised alignment of such an ePortfolio with academic development activities, staff performance planning and review, and promotion processes. After 2 years of pilot activity and exploration, the QUT Academic and Professional Staff ePortfolio (APSeP), based on Mahara open source ePortfolio software, was made available to all staff. It is a core service based within the eLearning Services department and fully supported by the ePortfolio team. Perhaps not surprisingly, many of the issues familiar across QSeP use, apply also to staff engagement with critical reflection and ePortfolio creation and curation.

This initiative has been well received by participating academics and by Human Resource managers who are supportive of the concept and keen to explore Mahara and to promote it. Feedback from the pilot phase of this staff instance clarified the need for a directly similar support approach as available for QSeP users, flexible, customisable and available at point of need.

From the point of conception of an institutional wide ePortfolio initiative, buy-in by senior management is essential. At project initialisation senior staff play an important role in rallying support. By virtue of their position in the institution, their influence affects positive outcomes for managing high level change, communication, resourcing and funding, and embedding activities where most strategic value will be realised. This ensures ePortfolio is seen as the credible and significant activity that it is.

Senior staff also play a crucial role in establishing the factors which sustain the ePortfolio program/service. Every educational technology, where its use is optional, experiences peaks and troughs of use (Gartner, 2015). Any change in strategy, organisation, or leadership can influence perspective on value and impact, and in resource constrained environments ePortfolio needs to be and should be defensible.

Prior to the formalisation of an initiative such as ePortfolio there are many informal conversations that take place at various levels of the organisation. At the senior management level these conversations play a critical role in connecting the ePortfolio program into the formal conversations around strategies and sub-strategies

of organisational units. Collectively this ensures that the ePortfolio program is given the consideration, prominence, and support it needs to succeed, and that institutional strategy and governance is well aligned. The distillation of this is coherent approaches in curriculum and connected positioning of ePortfolio with respect to current and emerging learning and teaching needs.

Allan and Clelland (2012) found that top down support coupled with bottom-up grass roots initiatives most effectively drives successful, meaningful ePortfolio pedagogy. ePortfolio practice at QUT has achieved the current very high level of maturity based on a model of strong top down support for single unit initiatives which have continued like spot fires to ignite enthusiasm across all discipline areas. Marshall (2011) maintains that institutions must “provide systems and environments that result in wider adoption of successful ideas” rather than relying on early adopters and local champions (p 31). QUT continues to evaluate ePortfolio in the context of new and emerging university-wide strategy, institutional reaction to a changing government agenda for Australian higher education, and national and international factors such as graduate employability. There will always be any number of agendas, pressures, strategies, for institutions to grapple with, and at QUT the constant has been steady, evidence based support for learning initiatives coupled with strong institutional leadership.

Without the strong support of senior managers it is difficult to establish the breadth and depth of practice that brings the impact discussed in this chapter, and as a consequence uptake and support will be piecemeal which can lead to abandonment of the ePortfolio program. Garrison and Vaughan (2013), emphasise the need for strong senior leadership to promote pedagogic innovation and strong uptake for learning and teaching initiatives.

Conclusion

The current chapter has provided insight into ePortfolio pedagogy in Australian higher education through specific use cases and has suggested the types of challenges and opportunities that occur and a support strategy that has the potential to steer ePortfolio learning into the future through continual evaluation of practice, evidence based decision making, flexibility to contextualise across different discipline areas and meet the diverse range of tasks which align with an ePortfolio approach. It suggests the importance of recognising the factors that are critical to success for an institution and the value of promoting a culture that understand and supports pedagogic innovation.

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<http://www.springer.com/978-981-10-1731-5>

ePortfolios in Australian Universities

Rowley, J. (Ed.)

2017, XVI, 203 p. 24 illus., Hardcover

ISBN: 978-981-10-1731-5