

Chapter 10

ePortfolios: Integrating Learning, Creating Connections and Authentic Assessments



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Abstract Over the past decade in the tertiary education environment, there has been an increasing level of importance placed on the integration of digital technologies to support student learning and prepare students for transition into the world of work. ePortfolios have been recognised as a digital technology that has the capacity to support student growth and development. Through the use of an ePortfolio, a student can create a well-organised visually appealing record of their academic and professional knowledge, skills and attributes as well as practical achievements. The journey of the creation of the ePortfolio has the potential to develop a student's professional identity, supporting students to make connections between their learning, the associated assessment tasks and to assist in the preparation required for transitioning into employment. The effectiveness of an ePortfolio as a tool for life-long learning is underpinned by common challenges faced by educators regarding the development of any learning activity. This chapter describes a conceptual framework of how to design and integrate learning activities for ePortfolios, how to support learning activities with authentic assessment that then contribute as evidence for collection and inclusion in ePortfolios and also how to assess ePortfolios using rubrics. The final section of the chapter provides a case study example of how an ePortfolio project has been scaffolded and integrated into a postgraduate coursework program at Griffith University, the Graduate Diploma in Clinical Physiology, using the whole-of-program or program-wide approach.

Keywords ePortfolios · Program-wide · Employability · Professional identity · Reflective practice · Work integrated learning

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C. N. Allan et al. (eds.), *Blended Learning Designs in STEM Higher Education*,
https://doi.org/10.1007/978-981-13-6982-7_10

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10.1 Introduction

10.1.1 *Learning Portfolios and Reflective Thinking*

Portfolios have been increasingly used in higher education to promote reflective thinking and reflective practice. As Bourner highlighted “over the last decade, reflective learning has made increasing inroads into the higher education curriculum. Recognition of the accelerating pace and impact of technological change, economic change and social change has created awareness of the need for graduates to be life-long learners” (2003, p. 267). This style of reflective portfolio has also been described by Oemann as a *learning Portfolio*, *integrative Portfolio* or a *Growth and development Portfolio* (Green, Wyllie, & Jackson, 2014). Reflective practice promotes a more in-depth style of learning in which students are encouraged to analyse their past experiences to make meaning and “judgements about what has happened” (Dunn & Musolino, 2011, p. 128). This style of portfolio is arguably the most robust and beneficial style of portfolio for assisting students to transition from the educational institution into the world of work. The *learning ePortfolio* encourages the students to create an individual learning space and “allows learners to move beyond *what* they have learned to consider *how* they have learned and to understand the connections inherent in the creative process of learning” (Hallam & Creagh, 2010, p. 181).

Reflective writing in learning portfolios is utilised widely in university courses that include a work integrated learning (WIL) component, particularly those courses which require competencies to be demonstrated during the WIL experience. A benefit of this style of portfolio lies in its ability to integrate and assess reflection as a means for students to connect experiences in the WIL environment to learning objectives for the chosen course of study (Tailor, Dubrey, & Das, 2014; Curtis & Wu, 2012). In the WIL environment, students participate in experiential learning opportunities where experiential is defined “where students ‘learn by doing’ rather than learn through telling” (Buzzetto-More & Alade, 2008, p. 46). Experiential learning can take a variety of forms ranging from observational experiences to problem-based learning projects to authentic worksite placements incorporating an internship style of professional placement. From the student perspective, the incorporation of WIL into an academic course provides an opportunity to integrate theoretical knowledge with practical application in real-world situations, thus providing authentic learning opportunities (McLachlan, Yeomans, & Lim, 2017). Students collect evidence of their WIL experiences for their portfolio and using reflective practice analyse their development in learning and change in knowledge that has occurred because of their WIL experience. This reflective process provides students with a formal opportunity to consider their successes and explore areas for growth. In doing so, students are encouraged to identify their values and how these influence their professional behaviours as well as facilitate goal setting. Reflection aids to shift learning from teacher-directed to student self-directed learning “where students take responsibility for their own learning” (Buzzett-More & Alade, 2008, p. 46). As Curtis and Wu emphasised, “ePortfolios have been recognized for their ability to support the

learner's self-reflection" (2012, p. 70). This style of portfolio is referred to by some authors as an *Integrative Portfolio* (Fitch, Peet, Reed, & Tolman, 2008).

The strength of learning portfolios is the incorporation of reflective thinking and critical analysis. Through the process of reflective thinking, students begin to create connections; linking past knowledge and experiences to current practice and examining areas for future development. By 'looking backward' reflecting on past experiences, students create connections between their current knowledge and identify gaps and areas for future development, that is, 'looking forward'. In learning portfolios, students are encouraged to create a narrative that describes the importance of the inclusion of each piece of evidence explaining its significance and how it has contributed to their learning (Andre, 2010). By students considering the value of each artefact or piece of evidence that they choose to include in the ePortfolio, students undertake a form of self-assessment, reviewing and appraising each artefact which ultimately "empowers students to become the drivers of their own development" (Pelliccione & Dixon, 2008, p. 759).

This process of considering each artefact supports critical thinking and reasoning, enabling students to project forward to future practice fostering the development of a professional identity (Andre, Heartfield, & Cusack, 2017). Matthews-DeNatale describes the purpose of learning Portfolio as to "engage students in iterative cycles of creating work, reflecting upon work, revising work in response to metacognition, and integrating revised work within a larger context of professional and/or learning identity formation" (2013, p. 42). The significant benefit and the underpinning concept of a learning portfolio is this step-wise process of 'collect-select-reflect-connect' which supports learning first and assessment second (Hughes, 2008). Thus, focusing *assessment for learning* rather than *assessment on learning* (Barrett, 2007).

10.1.2 ePortfolios: Benefits, and Challenges

The capacity for students to utilise ePortfolios to assist their transition into the world of work, to develop their 'employability', is also increasing in recognition. ePortfolios are not only relevant to arts, education and health professionals but are gaining importance for undergraduate science, technology, engineering and mathematics (STEM) students with research in the US, suggesting that ePortfolios will become a necessary tool for students to demonstrate to prospective employers their growth, development and attainment of STEM skills (Brubaker, 2015).

The strengths of applying reflective practice in the *learning ePortfolio* are well recognised as the ePortfolio platform allows students to appraise the application and relevance of their selection of artefacts, providing links to external artefacts to further support relevance and to allow feedback via collaborative learning environments (Andre, 2010).

Through the use of an ePortfolio, students can create a well-organised, visually appealing record of their academic and professional knowledge, skills and attributes, as well as practical achievements in WIL learning opportunities. The ePortfolio supports students to make connections between their learning objectives and learning

Table 10.1 Benefits that ePortfolios bring to learning and teaching (Adapted from Curtis & Wu, 2012, p. 68)

Key component	Description
Relevant and authentic	Students can create connections between learning objectives, assessment and learning outcomes through the use of reflective practice. This develops self-awareness, creates meaning in their learning (linking tacit with constructed knowledge) and promotes a professional identity. Authentic learning is supported through experiential learning activities that are selected, collected and reflected upon in the ePortfolio
Accessible	Students can quickly assemble and access evidence of learning offering a useful tool to collect, select and reflect as well as efficiently draw on a broad range of stored information via tagging of artefacts
Sustainable	Due to the transportable nature of ePortfolios, students are encouraged to engage in lifelong learning utilising the ePortfolio beyond graduation
Visible	Allows different audiences to access evidence for specific needs; from ‘internal’ users (the student themselves for their learning journey and the academic for assessment of student learning) to external users (employers, professional associations, accrediting organisations)
Scalable	Allows integration across the curriculum from use in individual subjects to across an entire course/program; a program-wide or whole-of-program approach

goals, the associated assessment tasks, the skills developed through WIL projects and the preparation required for transitioning into employment. ePortfolios are also an example of authentic learning, in which learning is connected to and supported by real-world examples, particularly when experiential learning is involved. As stated by Matthews-DeNatale, “ePortfolios are a key strategy for connecting workplace-based experiential learning and academic coursework” (2013, p. 44). ePortfolios are frequently used in teacher education and healthcare disciplines. With an increasing number of STEM university courses incorporating experiential learning activities as the core components of the curriculum, the use of ePortfolios in the learning and teaching of STEM students is an area primed for exponential growth. The key benefits of an ePortfolio embedded within the curriculum in higher education are summarised in Table 10.1.

10.1.3 Practical Considerations and Challenges to ePortfolio Implementation

As with any learning activity, particularly digital activities, there are challenges to the ePortfolio format.

ePortfolios can be time-consuming for the developer (i.e., the student) if a lack of structure is provided on how to develop the ePortfolio. The student can lose sight of the purpose of an activity within the ePortfolio or lose sight of the meaning of the ePortfolio as a whole project. Clear instructions should be provided on the expectations regarding the minimum requirements of the evidence required to be demonstrated in the ePortfolio. The purpose of the ePortfolio needs to be clearly conveyed to the students so that they can create meaning and contextualise the ePortfolio process as an authentic component of both their learning and their assessment (Zaldivar, Summers, & Watson, 2011; Light, Chen, & Ittelson, 2011). As Reynolds and Patton state “if we don’t make the goal explicit, our students don’t have the opportunity to make this learning intentional” (2014, p. 43).

Students should also be provided with clear instructions on *what not to include in their ePortfolio* (Bacabac, 2013). If the purpose of the ePortfolio is to be an integrative or learning portfolio, it will be appropriate to show the development of learning over time. For example, the student may show a draft of an assessment item, reflect on that draft after receiving feedback from an instructor then display the final product, describing the development process (or action plan), thus evidencing their analysis skills and development of learning. However, if the ePortfolio is to be a professional portfolio for showcasing purposes to external viewers, the process of including drafts, reflection on feedback and the final product would not be appropriate to add as the student should be including only the most relevant and best examples of work (Sutherland, Brotchie, & Chesney, 2011; Andre et al., 2017).

Students may struggle with the technical skills required to develop the ePortfolio; thus academics need to *consider what Information Technology (IT) support services will need to be provided* and how students will access these. The opposite end of the scale is an IT-savvy student who is comfortable with using new technologies. This type of student can become distracted by the technology of the ePortfolio itself and once again can lose sight of the purpose of the ePortfolio, creating a final product that may be aesthetically pleasing but lacks substantial or relevant content, that is, ‘all style, but no substance’.

Assessors of the ePortfolio (examiners) may require technical training and find the assessment process time-consuming and open to subjective assessment, particularly if it is not supported by assessment rubrics (Andre, 2010; University of New South Wales, 2018).

ePortfolios should be integrated across the degree program (a program-wide or whole-of-program approach) to ensure maximum learning opportunities. To have the ePortfolio as an assignment ‘added’ into one subject will diminish the value of the ePortfolio process for students, as students may view the ePortfolio task as a lesser priority and will tend to allocate less time to the project. By making the ePortfolio

integrated within a course, it is made clear to students that there is an expectation that making connections is an integral part of their learning journey within the subject/course (Reynolds & Patton, 2014). The integration of an ePortfolio across the life cycle of a degree or program of study has the potential to increase student ownership of learning. Pelliccione and Dixon reflect that: “instead of viewing their engagement with the program as working through discrete ‘blocks’ of learning that may or may not connect to each other, the students in the study described how they were able to ‘see the whole picture’ and therefore ‘make sense’ of their learning over the duration of the degree” (2008, p. 759). A program-wide or whole-of-program approach to ePortfolios is further supported by Housego and Parker who state that “whole-of-program ePortfolios could address a major issue in many existing programs – the lack of a coherent and effective approach to the learning and attainment of graduate attributes” (2009, p. 418).

10.2 Designing ePortfolio Learning and Assessment Activities: Rethinking and Redesigning Curriculum

10.2.1 Considerations of Curriculum and Planning Design

The consideration of the implementation and integration of ePortfolios should not be taken lightly and needs to be supported by pedagogic evidence. The decision to incorporate ePortfolios must be preceded by a carefully considered approach in which the purpose of the ePortfolio and the context in which it will be used are identified and aligned (Watty & McKay, 2015). Watty and McKay argue that ePortfolio design must be “premised on thoughtful consideration of its pedagogical underpinnings explicitly aligned to student learning outcomes” (2015, p. 195). Scepticism may enter the decision process, and you may ask the question of ‘why ePortfolios?’. As mentioned previously, the concept of a learning portfolio is not new to educational practice, however, momentum has gained on the whole-of-program implementation of ePortfolios due to the recognition of the strength and ability of ePortfolios to extend beyond the classroom and develop key aspects of student development, in particular, “skills and competencies; transformative potential; reflection; identity; active learning/student-centred engagement; employability; and assessment” (Watty & McKay, 2015, p. 195).

Several key steps should be considered in the process of implementing ePortfolios in the curriculum. These steps provide a practical approach to the planning and design of ePortfolios and are summarised in Fig. 10.1 and are then further described in the text following.

Identify To understand the needs of the internal stakeholder (i.e. the student) start with revising the challenges that ePortfolios can present. For example, will the majority of your learners be technologically savvy, or will they struggle with the technical

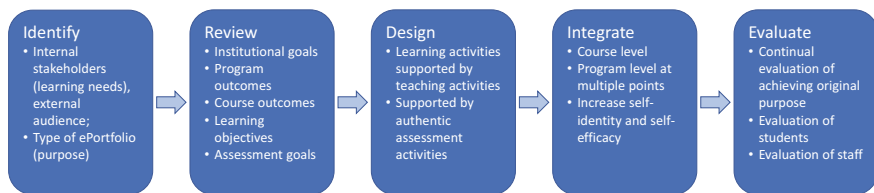


Fig. 10.1 Planning and design considerations for ePortfolios (Light, Chen, & Ittelson, 2011; Matthews-DeNatale, Blevins-Bohanan, Rothwell, & Wehlburg, 2017)

aspects of the ePortfolio? Are your students new to higher education (entering directly from secondary studies at the undergraduate level) or will they be postgraduate students? Knowing your students, their past experiences, their strengths and weaknesses assist in clarifying the learning needs of the students and thus define what the purpose of the ePortfolio will be for your students. There is equally a need to identify the requirements of the external audience or end-product users/viewers, which may be merely the student themselves or may include professional associations, regulatory bodies and potential employers.

Once you have reviewed the needs of both internal and external viewers, it becomes simpler to define the purpose for the ePortfolio—Is the ePortfolio to be a showcase, professional or learning (Integrative) ePortfolio? What do you want your students to gain from the ePortfolio? What knowledge do you want them to seek and obtain? What concepts do you want the students to focus their learning on? Will you require students to demonstrate competency? How can students demonstrate their progression of learning?

Review Each university has a version of graduate outcomes or attributes which are descriptions of the generic qualities and skills their graduates possess. Examples of graduate attributes include the possession of discipline-specific knowledge, communication skills, teamwork and collaboration skills, innovation and entrepreneurial skills. Many of the graduate attributes are generic or transferable skills. To support the program-wide integration of an ePortfolio, the graduate attributes of the institution should be mapped across the program. ePortfolios can support the development of graduate attributes, as graduate attributes are developed over time across the life cycle of the program and an ePortfolio if embedded across the program can serve as a repository to capture evidence of the development of graduate attributes (Housego & Parker, 2009). Existing program-level and course (subject)-level learning outcomes should be reviewed to identify how an ePortfolio can meet and enhance these objectives. Drilling down to learning and assessment objectives in individual courses can then provide a ‘best-fit’ approach to the design phase of the ePortfolio which will ensure a ‘fit-for-purpose’ approach. Existing learning, teaching and assessment items within courses can be evaluated for their usefulness and appropriateness for inclusion in the ePortfolio, as several existing items may be able to be adapted or reframed to support the purpose of the ePortfolio (Housego & Parker, 2009).

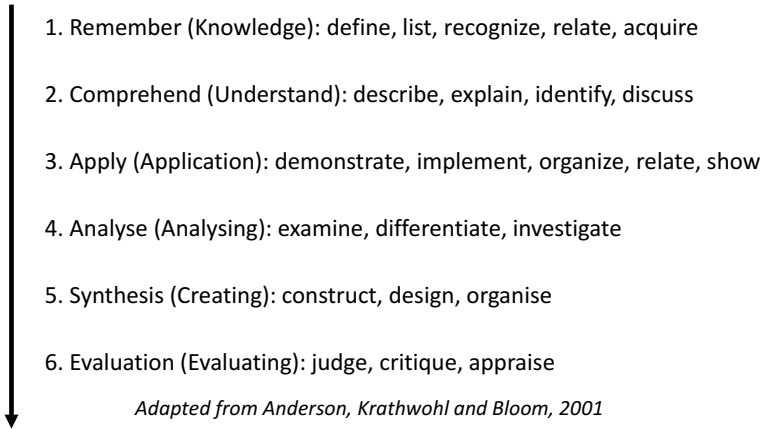


Fig. 10.2 Bloom's taxonomy. Adapted from Anderson, Krathwohl, and Bloom (2001)

Design Learning objectives or outcomes are the starting points for designing ePortfolio learning activities. Learning outcomes are measurable results that the student will have the opportunity to develop and demonstrate during a course. For learning outcomes to be a useful and robust tool to direct student learning, the learning outcome must be detailed and measurable (Reynolds & Patton, 2014). The language of learning outcomes should be clear and explicit. Bloom's Revised Taxonomy of Educational Objectives (Anderson, Krathwohl, & Bloom, 2001) recognises increasing levels of cognition. The learning outcome verbs in the taxonomy can assist you to communicate to students what they are required to achieve. For example, the levels in the taxonomy (increasing from lowest to highest order thinking) are shown in Fig. 10.2.

ePortfolios need to balance the priorities of learning and assessment as well as the needs of the students with the needs of the teaching staff. An important factor to consider when incorporating the use of ePortfolios in a program is to consider the principles and process of learning design. There are many different models of learning which can be utilised to design learning activities including Fink's Taxonomy of significant learning and Kolb's spiral of experiential learning. Kolb's theory of experiential learning is particularly applicable to the development of ePortfolio activities beginning with concrete experience, followed by reflective observation, abstract conceptualisation and active experimentation (Kolb, 2014). ePortfolios champion experiential learning when students are supported to carefully choose experiences that are supported by reflection, critical analysis and synthesis. Thus, learning activities in ePortfolios must be student-centric, focused on learner control, permitting students to customise their learning environment to maximise the creation of connections (Tosh, Wermuller, Chen, Light, & Haywood 2006). Learning and teaching activities need to be aligned with both learning outcomes and assessment methods to

facilitate students to create meaning and augment student engagement (Light et al., 2011).

Integrate As stated previously, when learning activities are integrated across a program of study where students are required to add evidence to their ePortfolio at several points throughout their program, students can make connections to their learning and are more able to self-assess and measure the extent of their learning. This, in turn, leads to an increase in students' perception of their level of engagement with their learning, their self-confidence, self-management and self-efficacy (Reynolds & Patton, 2014; Matthews-DeNatale et al., 2017; Bryant & Chittum, 2013).

Evaluate As with the introduction of any substantial change to the structure of learning, teaching or assessment, the process of embedding of an ePortfolio across a course or program should be evaluated for the level of achievement of the purpose and the desired outcomes of the change (Buzzetto-More & Alade, 2008). The evaluation process should involve an appraisal of students regarding their interactions with the ePortfolio; Did students perceive an increase in self-confidence? Did students create more in-depth and broader connections with their learning? What additional skills did they develop through the use of the ePortfolio? Benefits and challenges for the academic in the embedding process should be equally evaluated to identify gaps for further training in turn provide opportunities for continual beneficial progress to occur. Through this review process, the value of the ePortfolio can be measured and provide a means to "ensure purposeful longitudinal growth and continuous improvement within an academic culture committed to assurance of learning and student learning outcomes assessment" (Buzzetto-More & Alade, 2008, p. 68).

10.2.2 Considerations of the Use of Assessment in ePortfolios

Assessment in ePortfolios can be used in the higher education field to "direct learning and to provide recognition of achievement" (Andre et al., 2017, p. 88). A key rationale for the use of assessment in ePortfolios is to provide the opportunity for both formative and summative assessment. The use of formative assessment in the early stages of the creation of an ePortfolio provides students with an opportunity to receive constructive feedback that can stimulate and support deeper learning. The use of summative feedback in the later stages of the ePortfolio allows students to select the most relevant and highest quality examples of their work. Scaffolding both summative and formative assessments in an ePortfolio supports the concept of an ePortfolio as a 'continuum' across the curriculum and the idea that ePortfolios are collections of work curated by the learner (Clarke & Boud, 2016). The flexibility and adaptability of ePortfolios as an assessment tool "provides the student with authentic, reflective, interactive and individual features ... [making] this a truly learner centered activity" (Mason, Pegler, & Weller, 2004, p. 719).

As part of the design of the assessment activities associated with the ePortfolio, a decision should be made regarding how the assessment will be graded. Will the

assessment be graded throughout the degree program, thus providing a learning portfolio style in which regular feedback is given to students; or will the ePortfolio be assessed as a stand-alone piece of work at the end of the program as a showcase ePortfolio? Obviously, there are disadvantages for both the student and the academic of grading at the end of the program. By grading only at the end of the program, progressive formative assessment is excluded, self-directed learning for the student is not facilitated, and the task of grading for staff can prove to be a potentially arduous undertaking to grade all the work at the end of the program (Reynolds & Patton, 2014).

Assessing ePortfolios is not without its challenge. A salient point to consider is the source of potential bias in the grading of ePortfolios, as examiners may be subjective in their assessment and may be “tempted to let irrelevant qualities, such as the quality of the writing, the structure and the lay-out of the portfolio sway their judgement” (Driessen, Overeem, Tartwijkstra, Van Der Vleuten, & Muijtjens, 2006, p. 863).

The use of grading rubrics can alleviate concerns regarding the subjectivity of the assessment process involved in ePortfolios. ePortfolio grading rubrics can provide validity and reliability to the assessment process (Andre et al., 2017; Light et al., 2011). This is particularly important given the number of reflective writing tasks included in the ePortfolio as well as the creative and technical components of the digital presentation of the ePortfolio. Referring back to the challenges of ePortfolios, assessors can find grading them arduous and time-consuming in the absence of a clearly constructed rubric, and hence rubrics that are student-focused and provide clear guidance in the levels of learning achievement have benefits for both the assessor and the student.

In summary, frequent opportunities for students to integrate reflections throughout the ePortfolio assessment on which assessors can provide regular formative feedback before the final summative assessment enhance the visibility of learning to both the student and external viewers (Light et al., 2011).

10.3 A Case Example

The Graduate Diploma of Clinical Physiology is a one-year professional program which integrates the development of clinical knowledge (the theory) with the practical application in a work integrated learning (WIL) context. The program consists of six courses in a two-trimester model. In the first trimester (12 weeks of teaching), students complete four courses covering healthcare law and ethics, research methodology, communication skills, reflective practice, pathophysiology, analysis and interpretation of diagnostic test results and bioinstrumentation. These courses are delivered in a combination of face-to-face lectures, workshops, onsite workplace visits in the hospital environment and online learning. In the second trimester, students complete 12 weeks of professional placement in a clinical WIL mode that encompasses two different areas of clinical physiology as well as attend face-to-face workshops.

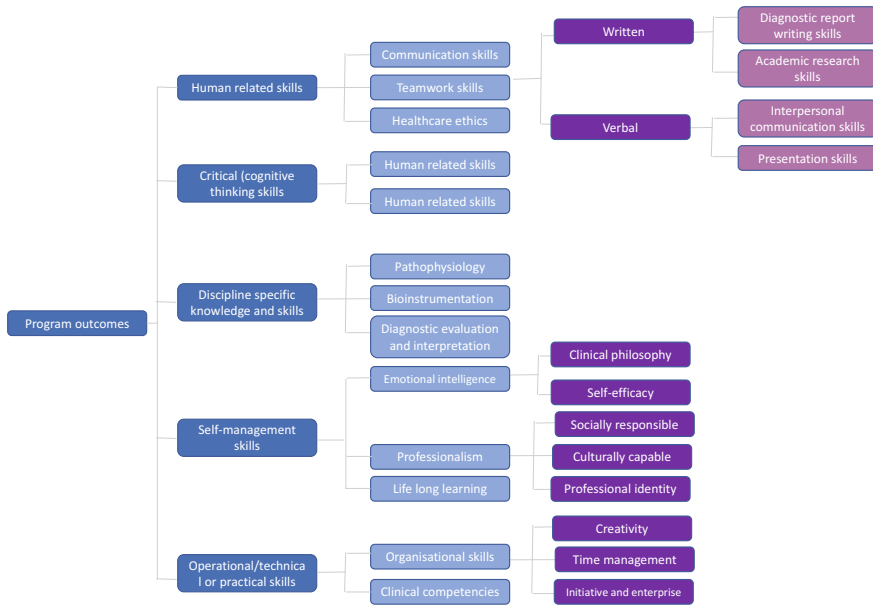


Fig. 10.3 Planning and design considerations for ePortfolios in the Graduate Diploma of Clinical Physiology

Graduates of the program seek employment as clinical measurement scientists in hospitals, and their role is centred around performing and interpreting diagnostic tests on patients. The profession into which these graduates are entering is a highly competitive market and one which requires students to possess more than discipline-specific knowledge. Graduates must equally possess a keen sense of awareness of their transferable skills.

The purpose of embedding an ePortfolio using a whole-of-program approach in the Graduate Diploma was to provide students with a tool through which they could collect, curate and communicate their academic and professional knowledge, skills and attributes as well as their practical achievements in the WIL environment. On face value, this could be categorised as a showcase portfolio; however, the overall aim of embedding the ePortfolio throughout the program was to support students to establish connections linking theory and practise across the student life cycle: to transition in, transition through and transition out. This approach recognises that students’ needs, identity and goals change across the journey through their program (Lizzio, 2011). By utilising an ePortfolio to support the student lifecycle, learning, teaching and assessment activities with a strong focus on engagement with reflective writing, an ePortfolio can be fully integrated to provide a learning ePortfolio rather than just showcasing ePortfolio.

The starting point for the ePortfolio project in the Graduate Diploma was to review the program-level outcomes and the institutional graduate outcomes, then

amalgamate these in the context with knowledge, skills and attributes required by employers (professional outcomes). The professional outcomes were identified by reviewing professional association mission statements, standards and guidelines as well as surveying peak industry representatives. An example of this process can be seen in Fig. 10.3.

The next step was to identify the learning, teaching and assessment activities that currently existed in the program that supported the development of the desired outcomes and how these existing activities could be adapted or reframed and then integrated into the ePortfolio as evidence of the development of program-level outcomes throughout the lifecycle of the program. This, in turn, enabled recognition of gaps in content delivery and learning support and identification of new ways to integrate additional learning opportunities into the ePortfolio.

Table 10.2 demonstrates how one of the program level outcomes, human-related skills, was mapped. The mapping process involved:

1. Assessing the program for existing learning and teaching activities that developed human-related skills; this helped to identify any gaps in delivery and subsequently, further learning and teaching activities were then incorporated to further support this content.
2. Assessing the program for existing assessment activities related to and developed human-related skills and how these assessment items supported existing learning and teaching activities.
3. Identification of gaps in assessment activities and how assessment could be scaffolded throughout the program to support the learning and teaching activities over the life cycle of the program.
4. Identification of how students could produce and collect artefacts to be integrated into an ePortfolio to evidence their personal learning journey and thus the development of their human-related skills across the lifespan of the program.

In particular, when reading through Table 10.2, in the “Assessment Activity” column, existing assessment items were examined for their suitability for incorporation into an ePortfolio. What was identified was how these assessments could be adapted and included in the final ePortfolio project, which is shown in the “Artefacts to be integrated as ePortfolio evidence” column. This process involved student submitting the various pieces of assessment listed in the “Assessment Activity” column at various times during their program for both formative and summative assessments, receiving feedback on the assessments and then incorporating these assessment items as artefacts in their final ePortfolio submission. The students are encouraged to review the feedback and make appropriate alterations to their assessment before the final submission of the ePortfolio. By using this process, students have the opportunity to take greater ownership of their learning and can further demonstrate the progression and development of their learning over time throughout the program.

A key component acknowledged in the mapping process was the identification of the lack of support for reflective writing in the program and the need to incorporate reflective practice and reflective writing into the ePortfolio project to allow the Portfolio to be process-driven instead of product-driven. As emphasised earlier in

Table 10.2 Program-level mapping of ePortfolio activities for human-related skills

Human-related skills	Time in program	Learning and teaching activity	Assessment activity	Artefacts to be integrated as ePortfolio evidence
<i>Communication skills</i>				
Written	Trimester 1	Library research skills, academic writing skills and academic integrity workshop	Pathophysiology research assignment; Bioinstrumentation equipment comparison assignment	Assignment excerpts with links to full assignment with a supportive statement
		Career planning and placement preparation workshops	Professional CV Professional statement	'About Me' home page written statement ± video vignette
	Trimester 2	Case studies workshop	Clinical case studies (WIL)	Case studies examples with a supportive statement
Verbal	Trimester 1	Communication skills workshops	Formative seminar presentation (week 2) Summative seminar presentation (week 13)	Presentation slides/video recording
	Trimester 2	Interview skills workshops	Mock interviews (formative) Summative WIL seminar presentation	Goal-setting task Reflection on the development of presentation skills across the program
Teamwork skills	Trimester 1	Pathophysiology group Problem-Based Learning (PBL) activities	In class PBL (formative) PBL short answer examination questions (summative)	Reflection on challenges of PBL group work
	Trimester 2	WIL participation	Clinical Supervisors assessment of teamwork collaborative skills	Clinical Supervisors report from WIL
Healthcare ethics	Trimester 1	Lectures and workshops in the principles and practice of healthcare ethics and law in the Australian hospital system	Ethical scenario case study	Reflection on the development of ethical knowledge and understanding
	Trimester 2	Workshops on professional practice	Critical reflection on a challenging ethical situation whilst on WIL	Reflection excerpt; Informational interview with Clinical Supervisor

the chapter, reflection can be referred to as the “central pillar of ePortfolios” (Watty & McKay, 2015, p. 199) which promotes metacognitive skills and guides students to analyse rather than merely assimilating facts. This is underpinned by the concepts regarding affective learning by Krathwhol, Bloom, and Masia (1964) and follows Schon’s theory of reflective practice (Rowley, Bennett, Blom, & Dunbar-Hall, 2014).

In order to support reflective writing with a whole-of-program approach, it was identified through the mapping process that students needed to be presented with multiple opportunities to reflect from the beginning, through the middle and to the end of the program. The aim of utilising reflective writing through the program was to empower students to discriminate how their learning and skills had developed over the whole program; i.e. the power of ‘making connections’ and thus facilitating more-in-depth learning. Rowley et al. emphasise this point in which they state “the creation of the ePortfolio involves reflection, organisation and critical thinking by the student in how to develop a portfolio that accurately represents their skills learnt and competencies developed during their program of study” (2014, p. 39). The most successful reflection occurs when reflection is scaffolded and supported by the educator.

As mentioned previously in the chapter, it is important to convey to the student the need to not just collect artefacts but to assimilate and evaluate the significance of the artefact that they have selected to include in the ePortfolio. This enhances the quality of the artefact, and Andre et al., (2017) draws attention to the point that an artefact in an ePortfolio is only truly converted to real evidence once the artefact has been reflected upon and validated in the context of the purpose of the ePortfolio. If an artefact is included merely for the sake of inclusion without the accompanying evaluation, then it is merely an object and does not meet the purpose or intended learning outcome (Andre, 2010). In the ePortfolio project in the Graduate Diploma, the decision was made that most artefacts would be accompanied by a brief supportive argument rationalising how the artefact enhanced learning and related for the purpose of the assessment activity and learning outcomes. By the student providing an explanation of why the artefact was included, context is provided for the inclusion of the artefact, which is an example of authentic learning. It was identified that some artefacts (e.g. certifications, log tally) that were collected from the students’ WIL experience and that were required to be included in the ePortfolio did not warrant a supporting statement.

Central to the concept of the development of reflective writing the ePortfolio project, it was important to make clear to students in assignment guideline statements the requirement of the inclusion supporting statements for the assignments. These assignments then formed compulsory elements in the ePortfolio. For example, in the assignment guidelines for the clinical case studies, students are instructed that when they include a case study in their ePortfolio, the case study must be accompanied by a supporting reflective statement. Prompts in the assignment guidelines to assist students to write their supporting statement include:

Explain what the major focus of each case study was, highlight the skills you developed in researching and writing each case study and how the case study contributed to your professional learning in the WIL environment on clinical placement. Your statement may be

structured as a reflection on your previous knowledge in the content area and how this was expanded and developed through the research of the literature regarding the case study and informed your future professional practice.

The learning objective for this task was for students to “examine changes and growth in personal learning in pathophysiological processes associated with your WIL experience and analyse how these changes integrated into the overall WIL experience”. This is a clear example of how the learning objective was linked with the assessment design and supported by reflective writing in the ePortfolio.

The process of reflection requires deliberate thought and awareness. Learning ‘how to reflect’ in a purposefully and meaningful manner can be an intellectually demanding task to which some students can be resistant to (Sutherland, Brotchie, & Chesney, 2011). Our initial experience with requiring students to produce reflective writing tasks was that many students struggled with reflective writing and felt that reflection was almost an alien experience to them. This experience reported by the students may have in part been due to the postgraduate students coming from an undergraduate scientific background, and as such, they felt more familiar with effective (cognitive) domains of reflection, rather than affective (metacognitive) domains of reflection. This experience is common amongst students who have not undertaken reflective writing before and as Duncan-Pitt and Sutherland commented that “reflection does not come naturally to all learners and the quality of reflection is variable” (2006, p. 73). Often students are reluctant to create honest and open reflections based on: fears of failure to meet assessment guidelines; a lack of trust or rapport with the assessing academic; wanting to complete the task merely to ‘tick the box’ rather than engaging with the task or a desire to jump to a conclusion and not undertake an evaluative process (Andre et al., 2017; Duncan-Pitt & Sutherland, 2006; Green et al., 2014). Reluctance by students to embrace reflective writing can diminish the educational benefit of reflection and can tip the balance of the reflective task to be product-driven rather than the intended process-driven (Barrett, 2007). The initial experience of the lack of engagement with reflective writing in the postgraduate students in the program highlighted a gap in the support that was provided to students in the learning activities. Following on from this, for further iterations of the program, additional reflective practice and reflective writing workshops were then embedded in the curriculum in trimester one to create a safe and inclusive environment to stimulate in-class writing activities and the sharing of narrative in class, and to build trust in the learner–teacher relationship (Green et al., 2014). The outcome of which was that students began to focus more on creating connections and making sense of their learning rather than focusing on just ‘getting through the task’ and concentrating only on the writing prompts to frame their writing.

The ePortfolio as an assessment task in the Graduate Diploma consists of individual pieces of assessment (either formative or summative) across several courses embedded throughout the program. The ePortfolio itself is then assessed holistically as an entire entity at the end of the program when students submit the ePortfolio as their final piece of assessment with the requirement that the ePortfolio must be completed to complete the program.

Table 10.3 Components of assessment for ePortfolio grading in the Graduate Diploma of Clinical Physiology

Technical consideration and organisation	Creativity/visual design	Selection and communication of content	Reflective ability
Clear and logical sequence and evident structure of the organisation of the content	Degree of personalisation and engagement with the ePortfolio	Course-related content is carefully selected to demonstrate the achievements of the student and relate directly to the ePortfolio	The demonstrated ability of the student to make meaningful connections between why content is chosen to demonstrate achievement
Degree of accessibility of the content—the ease of navigation	Degree of understanding of how the visual appearance of the ePortfolio contributes to professional identity	The purpose of the ePortfolio is clear	The demonstrated ability to reflect, interpret, evaluate and arrive at a meaningful resolution
Quality of the construction of the index/contents home page	Demonstrated appropriate use of multimedia	All compulsory elements are present	The quality of the narrative of the statements that accompany the individual artefacts
Quality and construction of each of the tabs (content areas) in the portfolio	The quality of the design and appearance of the ePortfolio—the degree of appeal of the layout and design of the ePortfolio (this includes the choice of background colour, readability of the text, alignment and positioning of content, the use of the white space to organise content)	Additional artefacts (additional to compulsory) have been included which demonstrate understanding of the needs of the intended audience	The demonstrated ability to demonstrate overall connection between the ePortfolio, the program and continued professional learning
	Utilisation of formatting tools	Standard of academic writing including spelling, grammar, referencing and academic integrity are observed	

There were four components of assessment that were identified as applying to the assessment of the final ePortfolio in the Graduate Diploma of Clinical Physiology:

- Technical construction and organisation
- Creativity/visual design
- Selection and communication of content
- Reflective ability

These four components of assessment were then linked back to the learning objectives of the program, and the overall purpose and aim of the ePortfolio and elements were determined for each of the areas of assessment. The expanded criteria for each of the areas of assessment are shown in Table 10.3.

In order to facilitate feedback and provide criteria for final grading of the ePortfolio, the assessment criteria shown in Table 10.3 were then used to develop a grading rubric. The experience with the grading rubric was initially mixed. The students found the rubric a positive and supportive experience and reported the benefits of having clear guidelines on how the assessment would be graded. The review of academic grading of the assessment found that in the first iteration of grading the ePortfolios, the rubric was too heavily weighted on the technical and creativity aspects of the overall ePortfolio project. Based on this observation, the grading rubric was altered to place a greater emphasis on the quality of the selection of content and the quantity and quality of the reflective writing in the ePortfolio. The reflective writing was assessed for the ability to support the inclusion of the artefact and to demonstrate the progression of learning. The outcome of the alteration of the grading rubric to have a greater focus on the reflective component provided a closer alignment with the purpose of the ePortfolio as a learning or integrative ePortfolio. An extract from the grading rubric, showing the standards for reflection, is provided in Table 10.4.

10.4 Conclusion

Bryant and Chittum call attention to the importance of ePortfolios through their statement that “the current literature suggests that ePortfolio can plausibly make great contributions to student learning when properly implemented” (2013 p. 195). Recognition of the potential of ePortfolios to stimulate learning, support assessment and provide a tool for life-long professional growth is gaining momentum in the higher education sector. ePortfolios are more than another technological tool. They have the potential to provide students with valuable insights into their learning styles and thus enhance the students’ degree of self-awareness. For ePortfolios to have the most significant influence on student learning, the design and purpose of the ePortfolio must be considered carefully by the implementing academic(s) and should be fully integrated across a program of learning, not just tacked on as an addition or afterthought. Learning and teaching activities need to be aligned with and supported by authentic and integrated assessment activities to ensure the quality of learning in an ePortfolio. Even though this process of alignment can be time-consuming, if careful

Table 10.4 Extract showing reflective component of ePortfolio grading rubric Graduate Diploma of Clinical Physiology

Description	Exemplary	Proficient	Developing	Novice	Unsatisfactory
Reflective ability (weighting 30%) assigns a mark out of 30	All content demonstrates an in-depth application of learning	Most content demonstrates an in-depth application of learning	Most content is accompanied by a caption or explanation of the importance of the item but lacks linking for the purpose	Some of the content is accompanied by a caption or explanation of the importance of the item. Minimal linkage to purpose	Poor recalling of events
The demonstrated ability of the student to make meaningful connections between why content is chosen to demonstrate achievement	All content is accompanied by a caption or explanation of the importance of the item which enhances the linkage of the item for the purpose of the ePortfolio	Most content is accompanied by a caption or explanation of the importance of the item and provides linkage to the purpose	Clear disclosure of events. The disclosure is good, however lacks some depth.	Poor recalling of events	The majority of the content is not accompanied by a caption or explanation of the importance of the item and even if explanations are present there is no linkage to the purpose
The demonstrated ability to reflect, interpret, evaluate and arrive at a meaningful resolution	Clear, comprehensive and in-depth disclosure of events	Clear and in-depth disclosure of events	Reasonable level of willingness to disclose personal thoughts,	Hesitation demonstrated in the disclosure of personal thoughts, demonstrating a surface level and not an insightful level of disclosure	Poor progression of disclosure of personal thoughts

(continued)

Table 10.4 (continued)

Description	Exemplary	Proficient	Developing	Novice	Unsatisfactory
The quality of the narrative of the statements that accompany the individual artefacts	Demonstrates a highly sensitive and insightful willingness to disclose personal thoughts and share these with the reader	High level of willingness to disclose personal thoughts and share these with the reader	Some lack of ability to express their feelings resulting in a surface level of emotional maturity and understanding	Some reflective writing pieces demonstrate the ability to self-critique in an effective manner. Struggles to provide constructive	No insight demonstrated into the ability to express or understanding their feelings
The demonstrated ability to demonstrate overall connection between the ePortfolio, the program and continued professional learning	All reflective writing pieces demonstrate the ability to self-critique in an effective manner and provide constructive suggestions or goals for adaptive changes in response and behaviour	Demonstrates a well-developed ability to express their feelings at a significant level of understanding Most reflective writing pieces demonstrate the ability to self-critique in an effective manner and provide constructive suggestions for adaptive changes in response and behaviour	Most reflective writing pieces demonstrate the ability to self-critique in an effective manner and provide constructive suggestions for adaptive changes in response and behaviour	None of the reflective writing pieces demonstrate the ability to self-critique in an effective manner. Constructive suggestions for adaptive changes in response and behaviour are absent, showing no description of opportunities for growth and/or goal setting	

consideration is not taken in the design and implementation process, then ePortfolios can become an “irrelevant activity if implemented inappropriately” (Andre, 2010, p. 123). The strength of ePortfolios lies in their capacity to build reflective ability and when used in both formative and summative formats, feedback over time in an ePortfolio assists students to identify their strengths and stimulates the development of future learning goals (Davis, McKimm, & Forrest, 2013). ePortfolios need to be supported by clear grading rubrics to provide students with well-defined objectives and explicit assessment criteria. The use of grading rubrics also supports academics to provide comprehensive feedback to support student learning and progression. In conclusion, ePortfolios should not be viewed merely as another assessment item but should be viewed for their potential to create connections and to extend beyond the classroom to facilitate a path of lifelong learning.

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