

The Cart Before the Horse? Exploring the Potential of ePortfolios in a Western Australian Medical School

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In 2014, the School of Medicine Fremantle of the University of Notre Dame Australia initiated a study to explore the curriculum underpinning portfolios used by first-year medical students. The School had used portfolios since 2005 and judged it timely to consider digital technologies as a mechanism to enhance student learning and improve efficiencies. A qualitative approach was adopted that investigated how the curriculum intersected with two ePortfolio platforms: Blackboard and Mahara. Data pertaining to the way in which Blackboard and Mahara ePortfolio platforms supported existing curriculum were collected from students through focus groups and tutors via interviews. As a measure of comparison, data were also collected from students and tutors who used the existing paper-based portfolio system. Findings confirmed that the curriculum should shape the way in which technology solutions are interpreted and implemented. It is posited that low-tech solutions are sometimes most appropriate for the curriculum context. However, exploring the potential of digital technologies helped the School to imagine other possibilities for curriculum renewal. Indeed, one outcome of the research was the development of a plan to re-invigorate portfolios, shifting the current task-based emphasis to one which recognizes the key role of reflection. The study may be of interest to teachers and managers seeking to explore ePortfolios as part of broader curriculum renewal initiatives.

An ePortfolio is an electronic collection of evidence that demonstrates a learning and/or professional journey over time (Barrett, 2010). Evidence may be in writing and/or include photos, videos, observations by mentors and peers, and reflective thinking. The key to an ePortfolio is that it includes reflection on evidence, such as why the evidence was chosen and what was learned from the process of situating the evidence in the ePortfolio (Barrett, 2010). ePortfolios, as a form of learning, are well established in the educational literature, and Long (2013) argued that they are becoming an important form of learning, particularly for 21st-century professionals. The purpose of this paper is to explore the potential and the pitfalls of using ePortfolios in a Western Australian medical school.

In medical education, there has been an expanding and broadening of the use of ePortfolios (Tochel et al., 2009) in an increasingly crowded curriculum. Traditionally, the term *curriculum* was equated with the syllabus or the content that medical students were required to learn (the formal curriculum). However, recent observations (Grant, 2010) suggest that curriculum is more complex. For example, in addition to that which is documented as the formal basis for instruction, consideration might be given to the way teachers interpret the curriculum which is manifested in their instructional strategies (the taught curriculum) and the knowledge, skills, and attitudes that students take away from the learning process (the learned curriculum). Consideration might also be afforded to the transmission of beliefs, norms and values conveyed through social structures of organizations and the attitudes and behaviors of staff (the hidden curriculum;

Hafferty, 1998). The curriculum can, therefore, consider planned and unplanned educational experiences, including those taught and learned and those transmitted through attitudes, behaviors, and social structures.

There are important pragmatic, strategic, and educational reasons that justify the need to move to an ePortfolio in medical education. Digital technologies are becoming a mainstay of educational and clinical practice. ePortfolios are easier to share, allow for portability, and if implemented well, can increase the efficiency of learning for both student and teacher. Educationally, ePortfolios support student-centered learning by focusing on practices such as reflection through journaling. In medical education, ePortfolios are worth investigating because they emphasize competency-based education, empowering students to capture what they do as well as what they know (Miller, 1990). This emphasis means less time-served experience and more actual demonstration of expertise. Affording students the locus of control denotes a philosophical shift from an institution managing the student's learning journey to students managing their own learning journey. It is accepted that successful implementation of ePortfolios in educational settings are characterized by some form of institutional scaffolding which gradually subsides as students realize the value of systematically collecting artifacts to support their professional identity and career progression (Van Tartwijk & Driessen, 2009). Ideally, therefore, an ePortfolio system should have institutional and student components.

ePortfolios can be seen as both a product to share with others and also as a process that supports learning and

development (Barrett, 2010). Although currently, ePortfolios are viewed by many in terms of their assessment capabilities, there are opportunities to conceive them as a broader teaching and learning solution. For example, students may be invited to share their ePortfolio with their clinical mentor to help the clinical mentor become acquainted with a student's current level of knowledge and skills prior to a clinical rotation.

The School of Medicine Fremantle (the School) of The University of Notre Dame Australia (the University) offers a four-year graduate-entry medical program and has used portfolios since its inception in 2005. The portfolio system is largely task-driven with three domains, in particular—personal and professional development (PPD), population and preventative health (PPH), and communication and clinical practice (CCP)—setting various written tasks for students to complete and submit to tutors in paper-based form. These tasks, administered across each of the four years of the program, have collectively become known as “the portfolio.” An example of a task, presented to first-year medical students, pertaining to Aboriginal health is shown in Figure 1.

In 2013, the School confronted growing calls from students and staff to consider more flexible and progressive approaches to the portfolio by conducting a scan of available ePortfolio options. An options paper was prepared using criteria of cost, functionality, security, and portability to rate three established portfolio platforms (Blackboard, Mahara, and PebblePad) in addition to social media solutions (e.g., Blogger, Google Drive) and productivity tools (Evernote). The options paper revealed that established ePortfolio platforms performed well against the chosen criteria, with cost being the major discriminator (only PebblePad was discounted on the basis of cost). Social media solutions did not rate highly on functionality and security, and the productivity solution (Evernote) was found to have inadequate scalability (e.g., limited file storage), along with cost implications for students. Acting on the options paper, the School decided to explore how two ePortfolio platforms, Blackboard and Mahara, intersected with the existing curriculum. Student and staff perceptions of the costs and benefits of implementing an ePortfolio solution were canvassed through focus groups and interviews.

Method

The study reflects the way in which current portfolios operate at the School. That is, a clinical debriefing tutor facilitates learning and reflection for groups of between eight and 10 students using pre-defined tasks as a focus. A sample of students ($n = 25$) derived from the 113 first year students enrolled in the Bachelor of Medicine degree was invited to take part. This sample comprised of three discrete

groups. A Blackboard group comprised of one tutor and eight students; a Mahara group comprised of one tutor and nine students; and a portfolio group, comprised of one tutor and eight students, who engaged with the existing portfolio system. The study centered on how students and staff used the ePortfolio in responding to three assessment tasks:

- an Aboriginal health reflection;
- a health and wellness reflection using a modified ESSENCE + model (Hassed, 2011); ESSENCE+ is a physician wellness program that focuses upon seven pillars of health (education, stress management, spirituality, exercise, nutrition, connectedness, and environment). The School also added an emotional intelligence component;
- an exam reflection.

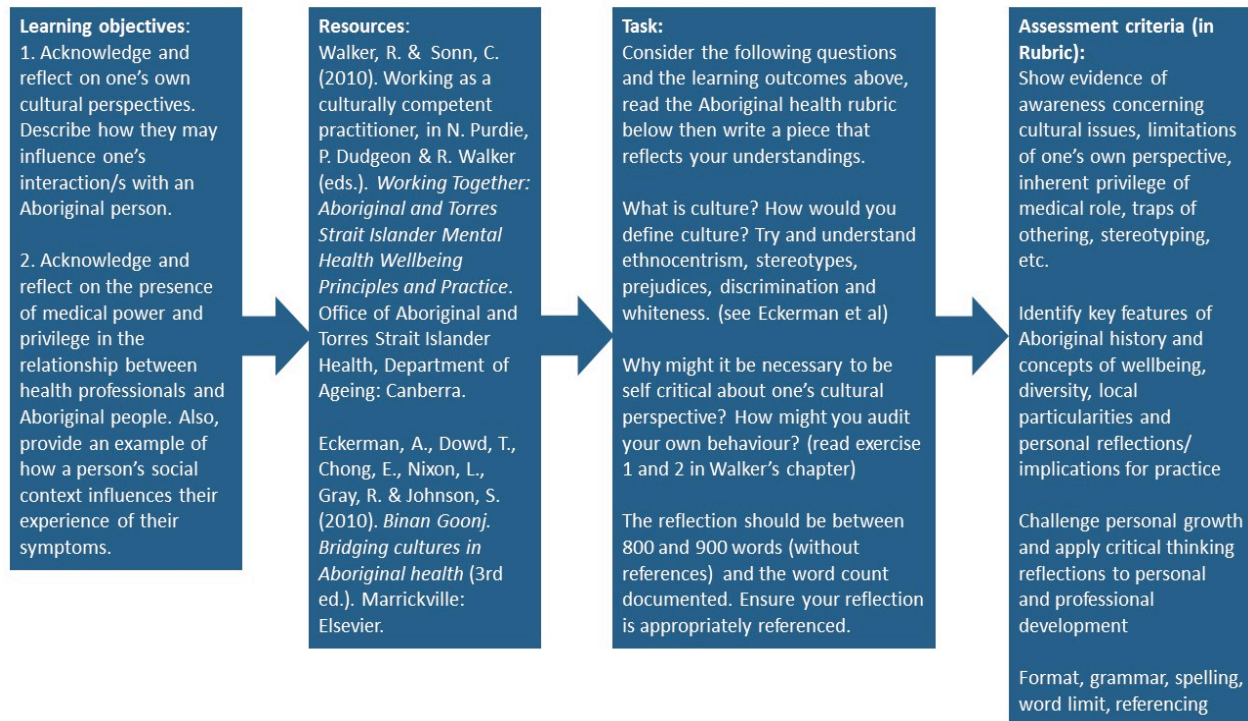
The assessment tasks were compulsory but formative, meaning that students did not receive a grade for their work. However, completion of tasks to an identified standard was mandatory to ensure progression through the course. The focus was on tutors providing quality feedback such that students were able to develop their reflective capabilities.

A technical introduction to the Blackboard and Mahara ePortfolio platforms was provided at the inception of the research. The purpose of the introduction was to show students and staff how the ePortfolio platform could add value to existing portfolio tasks. Other functions (e.g., reflective tools, action planning templates) were also introduced. The introduction lasted approximately one hour for Blackboard and Mahara groups.

Students had access to an ePortfolio platform between March and July in 2014, at which time the study concluded. The assessment tasks were also undertaken by the rest of the first-year medicine cohort as part of the existing curriculum. The tasks provided a focus for students using the ePortfolio tools. Students were also encouraged to be creative in bringing other artifacts (e.g., photographs and video clips) into their ePortfolio, in addition to using tools for reflecting and action planning and engaging more deeply with the tutor and peers. The formative nature of the assessment meant that student participation in the study did not carry the possibility of losing marks.

The study collected evidence about the costs and benefits of using ePortfolios from students via focus groups (questions attached as Appendix A) and tutors via interviews (questions attached as Appendix B). Three focus groups were convened at the conclusion of the study in July 2014 to gather student perceptions: a Blackboard group ($n = 8$), a Mahara group ($n = 9$), and an existing

Figure 1
A Typical Task in Aboriginal Health for First-Year Medical Students



portfolio group ($n = 8$). Feedback was also collected from the three tutors who facilitated learning in these groups. The quality assurance manager collected all the data at the School. Data collection techniques followed a semi-structured format that allowed the interviewer to engage participants in a conversation about the study. The semi-structured format consisted of a series of questions that were in the general form of a schedule, but the sequencing of the questions could be varied. Questions allowed scope for the quality assurance manager to ask further additional and probing questions from responses that were seen as noteworthy (Bryman, 2008). In focus groups, the quality assurance manager ensured that all participants had ample opportunity to share their views. Data were captured through audio recording before being transcribed textually. Transcriptions were imported into NVivo qualitative data analysis software. Data were coded into categories of intuitiveness, reflective capacities, communicative capacities, and sharing capacities. Coding by the researchers followed the coding considerations identified by Lofland and Lofland (1995).

Results

Students from both the Blackboard and Mahara groups were generally unimpressed by the potential of the ePortfolio platforms to help them engage

more deeply with the curriculum. In relation to the overall functionality of the ePortfolio, students were asked to rate the platform on a scale of 1-10, with 1 being the lowest and 10 being the highest. Students from the Blackboard group recorded a mean of 3.63 ($SD = 1.41$), while students from the Mahara group rated the platform slightly higher at 4.17 ($SD = 0.90$).

At the focus group sessions, students were invited to share whether they felt that the ePortfolio enabled them to be more effective as a learner. This question drew mainly negative responses, with an overriding perception that the software solutions were "overcomplicated" and "confusing." Typical comments included: "There is a disconnect between what you are trying to achieve, which can be kind of simple, and all these extra bells and whistles which are complicated" (Blackboard); and "I think the electronic submission was good, but I didn't find Mahara itself was a very useful platform."

Students were supportive of electronic submission to replace the current paper-based system. However, they revealed themselves as strategic learners (Ramsden, 2003), not deviating from what was expected in the curriculum: "I am studying medicine, and I am therefore not too interested in making it look pretty, uploading pictures and photos. I just wanted to do it, send it in and get it done" (Mahara); and,

We had so much on our plate this year with the learning that it was almost extra time playing around with a system, that you don't get any extra marks for, when we've already got so much stuff to do. So I don't think anybody really experimented too much. (Blackboard)

The main concern expressed by participants from the Blackboard and Mahara groups was having access to an efficient way of uploading files for assessment purposes. These sentiments were echoed by the existing portfolio group: "Printing can be time-consuming and expensive" and "The ability to upload assignments and not have to print them out would be appreciated."

One of the key advantages of using a portfolio to enhance student learning is that it encourages reflection (Barrett, 2010). However, students admitted to affording a low priority to their portfolios, many completing them just in time; "You just want to belt them out and get on with the study that actually is going to make us pass"; and "Completing the portfolio just before the deadline reduced the reflective element."

Students seldom used tools provided in the software such as journals, blogs, and planning scaffolds. Sharing and collaboration were not encouraged in the development of ePortfolios because tutors wanted to ensure that items were the students' own work. Concerns of tutors tended to be on their ability to provide quality feedback to students, and the capacity of the ePortfolio/portfolio system to promote reflection. Specific reflective tools and strategies were not integrated into the curriculum in either the Blackboard or Mahara groups. The tutor responsible for the Mahara group was confident that these tools would enhance students' reflective capabilities if implemented: "It will be very useful to use blogs and journals for students on a weekly basis to share reflections. We can easily develop this reflective part of their personality, and it will definitely be better professional development."

It is clear from the study that the curriculum shaped the way in which portfolios were used in practice. Currently, the curriculum, as it relates to portfolios, comprises a series of largely unrelated tasks that do not seem to invite deep reflection, subsequent action planning, or collaboration. Completion of the tasks did not attract a concrete reward for students in terms of an assessment grade. It is, therefore, unsurprising that students exhibited a lukewarm reaction to the ePortfolio platforms, apart from the efficiencies gained in being able to upload work electronically.

Discussion

Findings from the study suggest that students placed little value on portfolio tasks in the development of their identity as a doctor. In fact, they seemed to pay

lip service to the portfolio despite it being an explicit requirement for progression through the course. Although the technical introductions provided to acquaint students with Blackboard and Mahara were relatively short, students did not identify their technical competence as a concern. Rather, it seems to have been the way in which portfolio tasks *related* to the formal curriculum that promulgated a sense of apathy amongst students. It is suggested that the curriculum is at the root of this problem and that an absence of constructive alignment (Biggs, 1996) and authentic task design (Herrington & Herrington, 2006) might explain students' apparent indifference to the portfolio.

Constructive Alignment

Ensuring harmony between learning outcomes, learning activities, and assessment tasks is integral to curriculum design. Biggs (2003) suggested that "a good teaching system aligns teaching method and assessment to the learning activities stated in the objectives, so that all aspects of the system act in accord to support appropriate learning" (p. 10). This concept is what he calls constructive alignment. Although there is some debate on the theoretical integrity of constructive alignment and its practical application to improving students' educational experiences (Hussey & Smith, 2008; Jervis & Jervis, 2005), it is generally accepted that bringing together outcomes statements, learning activities, and assessment strategies provides a sound approach to curriculum design (Barrow, McKimm, & Samarasekera, 2010; Joseph & Juwah, 2012; Larkin & Richardson, 2013).

The way in which learning outcomes were expressed in portfolio tasks was inconsistent. For example, the three portfolio tasks considered in this study presented three different types of outcomes to students: program-level outcomes (exam reflection), course-level outcomes (aboriginal health reflection), and specific learning outcomes (health and wellness reflection). The design of learning activities and associated resources for clinical debriefing at the School are largely based on concurrent problem-based learning (PBL) cases that promote both *reflection in action* and *reflection on action* (Schön, 1987). Students engage in PBL, working through authentic cases in small groups (reflection in action), and then discuss and debrief these cases in specially arranged clinical debriefing sessions (reflection on action). Resources are provided on a weekly basis to acquaint learners with issues (e.g., ethical and professional dilemmas). Unfortunately, portfolio tasks are largely divorced from these processes. The challenge for medical educational designers is to ensure that clinical debriefing discussions and reflections are incorporated into the portfolio tasks. Such integration will increase the value

of the portfolio learning and reduce perceptions of the portfolio as simply “busy work.”

Summative assessment at the School for the two pre-clinical years is conducted at the mid-point and end of the academic year, and exam questions tend not to

draw upon the learning that emanates from student portfolios. There is a disconnect between the formative but compulsory nature of portfolio tasks and the high stakes summative assessment that occurs to facilitate student progression through the course. It seems that

Table 1
Analysis of the ESSENCE+ Portfolio Task Against the Three Features of Authentic Task Design as Identified by Herrington and Herrington (2006)

Aspect of the Task	Extent to Which the Task:		
	Is Ill-Defined	Has Real World Relevance	Can be Completed Over a Substantial Period of Time
Review and reflect on one or two of your significant experiences during participation in the ESSENCE+ process. You need to address the following points from the rubric:	The task is well defined and asks students to respond to a specific set of questions.	The task is relevant to students’ general health and wellbeing. However, there is no link between the task and the real world clinical and professional responsibilities of medical practitioners.	The task is built around a model of reflecting on the ESSENCE+ program that is run over a period of weeks.
Describe your personal reaction to the ESSENCE + experience	Descriptive and reflective.		
Explore how this has influenced your attitudes and behaviour.	Limited complexity. There is also an underlying assumption that the ESSENCE+ program has an inherent capacity to <i>influence</i> students’ attitudes and behavior.		
Connect your ESSENCE+ learning to one or two past experiences and emotions. What have you learnt about the state of your health and emotional wellbeing?	Limited complexity. There is an underlying assumption that the ESSENCE+ program will lead to greater student insights into their health and wellbeing.		
Has this program promoted wellness for you?	Limited complexity. Closed question.		
What has this experience taught you personally about your lifestyle choices and the change process?	Limited complexity. There is an underlying assumption that the ESSENCE+ program has reflective attributes that might lead to improved lifestyle choices.		

presenting portfolio tasks as formative and compulsory (i.e., barrier tasks) has generally resulted in students expending enough energy to enable their portfolio to be accepted as achieving a minimum standard.

In summary, variations in the way in which learning outcomes are presented, coupled with a lack of integration between the learning activities put forward in the portfolio and the summative assessments provided to students, have contributed to the portfolio tending to stand outside of mainstream curricula.

Authentic Task Design

Learning activities that have relevance to students' lives are more likely to result in deeper knowledge construction (Jonassen, Peck, & Wilson, 1999). Therefore, learning activities should closely mirror the way in which knowledge is developed and used in the real world. Herrington and Herrington (2006) argued that everything about the learning experience, from its context to how learners engage with activities and resources and the way in which learning is supported and assessed, should be authentic. The authors argued that three key features of authentic task design are that tasks are ill defined, have real world relevance, and can be completed over a sustained period (Jonassen et al., 1999). Table 1 provides an analysis of the ESSENCE+ portfolio task in relation to these three features.

From an instructional design perspective, there are some issues with the above portfolio task. Firstly, it is not anchored in a real world authentic clinical or professional context. There is a large body of educational literature advocating the design of curriculum for the professional world for which students are being prepared (McKenzie, Morgan, Cochrane, Watson, & Roberts, 2002). Medical students are hungry for opportunities to be exposed to clinical and professional problems. Situating the learning in the clinician's world, as opposed to the student's world, might have increased levels of student interest and engagement. Secondly, rather than being ill-defined, the task is prescriptive in that it is broken down into a series of discrete questions to be answered. Jonassen (1997) argued that ill-structured problems lead to deeper and more meaningful learning. Third, the task includes a number of perhaps inappropriate assumptions about the capacity of the ESSENCE+ program to stimulate student learning and reflection. These assumptions may lead student thinking, potentially depriving them of the opportunity to frame creative responses. Fourth, there is limited scope for student collaboration in completing the task. Collaboration may deepen understanding of concepts underpinning ESSENCE+. Fifth, the analytical and evaluative opportunities for learning are limited in the task design. For example, students might have been

afforded opportunities to critique or present alternatives to ESSENCE+. Finally, the task does not invite creative solutions. For example, asking students to create an online learning package to persuade or influence practicing clinicians and/or patients into changing their lifestyle choices.

Authentic learning has received widespread support in the educational literature. While it is tempting to see this as a panacea for portfolio curriculum in the School, first-year students are typically asked to respond to tasks by drawing on their own felt experience (i.e., considering phenomena in the context of their own values, attitudes, and behaviors). This approach, authentic being-as-learner (Ashton, 2010), may be more appropriate for adult learning contexts. However, further research is required to test the most appropriate learning designs in the early years of medical education, particularly in finding ways to increase student engagement outside of the clinical context.

Figure 2 gauges the ESSENCE+ portfolio task in relation to Anderson and Krathwohl's (2001) revised Bloom's taxonomy. It is clear that students are directed towards basic understanding and application to their own lived context. Designs that might encourage deeper learning such as analysis, evaluation, and creation of new knowledge were absent in the learning design.

It is evident that the School is at a particular stage of development with regards to its portfolio curriculum. It is posited that a portfolio system should first and foremost serve the needs of the curriculum. Figure 3 graphically represents the evolution of a portfolio from institution-centric to learner-centric. The School, denoted as a circle, is shown in the institution-centric stage.

An institutionally-centric portfolio sets defined tasks within prescriptive parameters. Responding to these tasks is a requirement for students to progress through the course. The institution "owns" the tasks, and grades (as opposed to learning) tend to be more valued by the learner. Institutional requirements foster an extrinsic form of motivation. As the portfolio system moves to a more institutionally sponsored model, assessment becomes primarily formative, focused on providing quality feedback for the personalised tasks that are chosen by the learner with expert guidance from tutors. The formative approach to assessment fosters a more intrinsic form of motivation. A learner-centric portfolio system might be characterized by greater levels of self-assessment and peer input along with just-in-time feedback oriented to workplace experiences, provided through a variety of sources. A constructivist teaching and learning environment affords opportunities for students to appraise their current understandings, engage in active and authentic meaning-making, collaborate with others to deepen their knowledge, and activate their meta-cognitive capacities. This type of curriculum,

Figure 2
Consideration of the ESSENCE+ Portfolio Task in Relation to Anderson and Krathwohl's (2001) Revised Bloom's Taxonomy

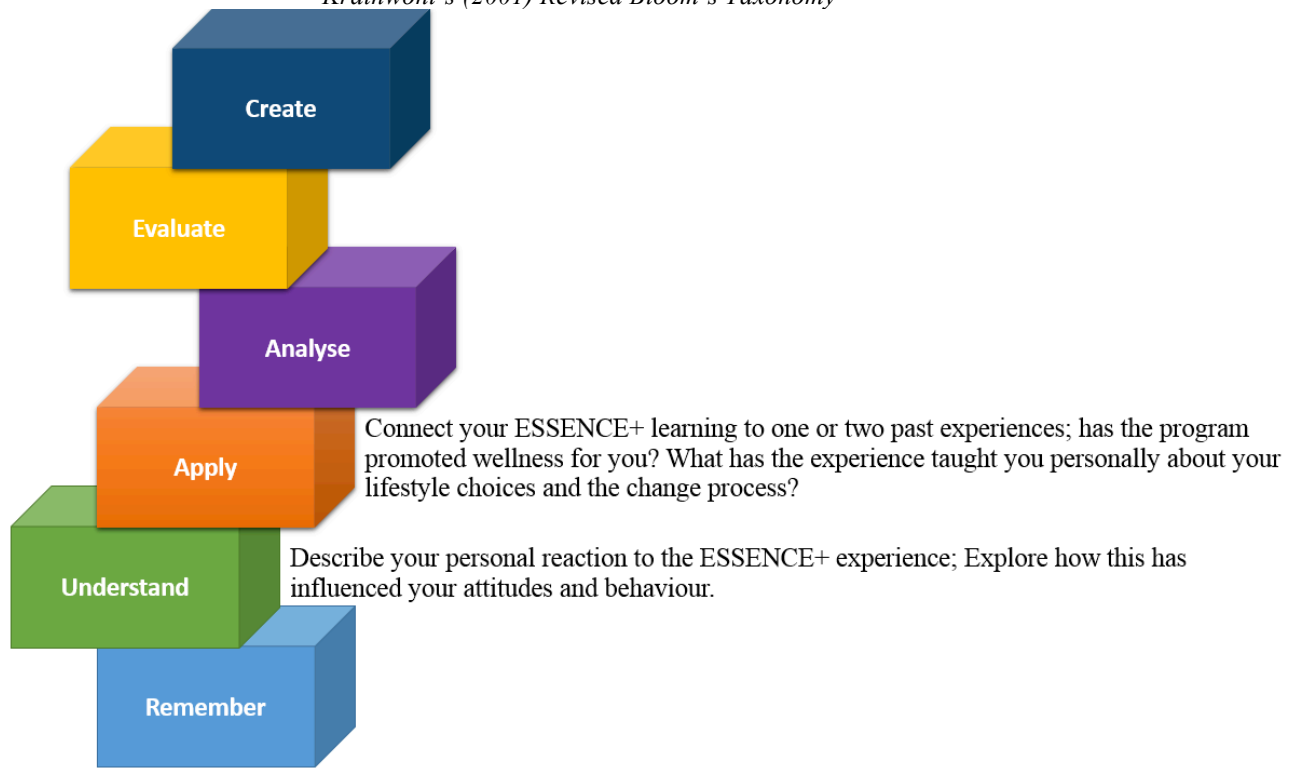
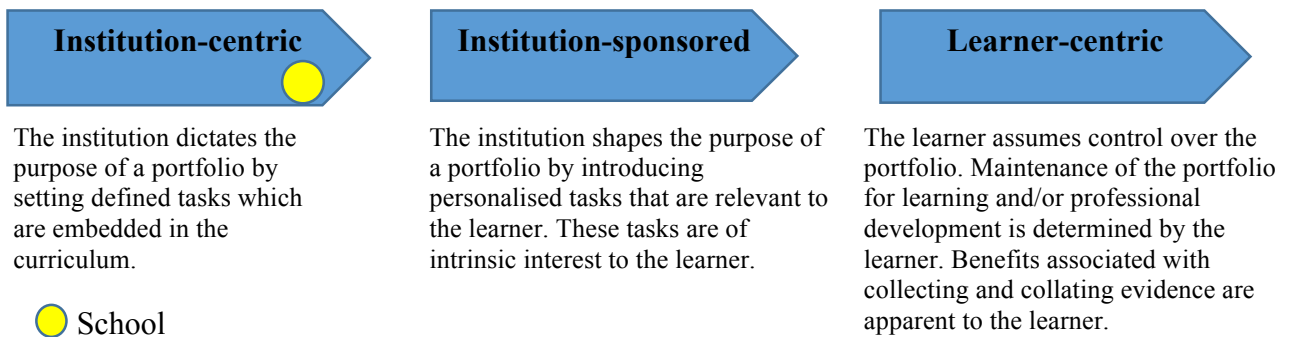


Figure 3
Stages of Portfolio Development



which has been shown to underpin learner-centered educational environments (Jonassen et al., 1999), is consistent with moves towards programmatic assessment (van der Vleuten, Schuwirth, Driessen, Dijkstra, Tigelaar, Baartman, & Van Tartwijk, 2012), which encourages students to generate evidence of their learning and institutions to make judgments about the quality of this evidence.

Ultimately, the curriculum should shape the way in which technology solutions are interpreted and implemented. It is argued that the selection of appropriate 21st-century digital tools, including an ePortfolio, depends on the extent to which the curriculum is institution- or learner-centered. An institution-centered portfolio may simply call for an electronic method of uploading documents efficiently

for tutors to view and grade. As such, the School has provided opportunities for electronic submission of assignments using the Blackboard learning management system (not the Blackboard ePortfolio) and implemented an action plan to enhance the personalization attributes of portfolio assessment tasks to move progressively to an institutionally sponsored portfolio model. These process changes offer a “fit for purpose” solution for curriculum renewal.

Current literature concerning the purpose of ePortfolios stresses the importance of reflection. Hall, Byszewski, Sutherland, and Stodel (201) argued that “all portfolios . . . should demonstrate reflection, evolution of thought, and professional development” (p. 745). It is interesting that in the current study, although all of the three tasks in the pilot were overtly reflective in nature, none were valued by students. Further research into students’ apparent indifference towards task-oriented assessments might be useful, particularly consideration of how the hidden curriculum might impact on learners’ dispositions towards reflection. As the School moves towards a learner-centered curriculum, more sophisticated ePortfolio tools and scaffolds may be required. For example, a reflective e-journal could be shared with others for feedback, goal-setting tools could integrate reflection and improvement, and collaborative tools could help deepen understanding through communicating with others. Assembling and publishing artifacts (including multimedia) in innovative ways could also be considered.

Conclusion

The study found that the current curriculum context in a metropolitan medical school in Western Australia does not necessitate a sophisticated ePortfolio system. To support its current curriculum, the School can use its Blackboard learning management system to facilitate uploading and marking of assignments. Low-tech ePortfolio solutions are sometimes most appropriate for the curriculum context, and can act as a valuable stepping stone to more sophisticated technology solutions. However, the study also found that the current curriculum could be transformed in at least three ways. First, it could be reshaped to evoke more constructivist learning and teaching practices, as described by Jonassen et al. (1999). These practices would likely facilitate a greater level of student engagement and also lead to a more authentic fit between university- and clinically-based learning. Second, the curriculum could be better aligned so that portfolio activities are explicitly linked to learning outcomes and underpinned by summative assessment. Alignment of tasks, learning outcomes, and assessment would most probably lead to an increase in

the extent to which students value the portfolio. Third, if, as Niemi (1997) suggested, reflection is central to the development of professional identity, then the curriculum should require students to take responsibility for reflecting on both their professional actions and their learning. Reflection should be woven into the design of tasks such that it becomes a habitual part of the learning process. If these transformations are implemented, then more sophisticated ePortfolio solutions could be sought. Although educational change initiatives should be shaped by curriculum, as opposed to developments in digital technologies, the study has shown that digital technologies have an important role in helping educators to conceive of possibilities. In this way, ePortfolios can provide a useful lens in which to gauge the value of current learning and teaching practices.

References

- Anderson, L., & Krathwohl, D. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York, NY: Longman.
- Ashton, S. (2010). Authenticity in adult learning. *International Journal of Lifelong Education*, 29(1), 3-19. doi:10.1080/02601370903475602
- Barrett, H. (2010). Balancing the two faces of ePortfolios. In S. Hirtz & K. Kelly (Eds.), *Education for a digital world 2.0*, 2, (pp. 291-310). British Columbia, Canada: Open School.
- Barrow, M., McKimm, J., & Samarasekera, D. (2010). Strategies for planning and designing medical curricula and clinical teaching. *South East Asian Journal of Medical Education*, 4(1), 2-8.
- Biggs, J. (1996). Enhancing learning through constructive alignment. *Higher Education*, 32, 347-364. doi:10.1017/CBO9781139048224.009
- Biggs, J. (2003). *Teaching for quality learning at university*. Maidenhead, UK: Open University Press.
- Bryman, A. (2008). *Social research methods* (3rd ed.). Oxford, UK: Oxford University Press.
- Grant, J. (2010). Principles of curriculum design. In T. Swanwick (Ed.), *Understanding medical education: Evidence, theory, and practice* (pp. 1-16). Chichester, UK: Wiley-Blackwell.
- Hafferty, F. (1998). Beyond curriculum reform: Confronting medicine's hidden curriculum. *Academic Medicine*, 73(4), 403-407. doi:10.1097/00001888-199804000-00013
- Hall, P., Byszewski, A., Sutherland, S., & Stodel, E. (2012). Developing a sustainable electronic portfolio (ePortfolio) program that fosters reflective practice and incorporates CanMEDS competencies into the undergraduate medical curriculum. *Academic Medicine*, 87(6), 744-751. doi:10.1097/ACM.0b013e318253dacd

- Hassed, C. (2011). *The essence of health*. Sydney, Australia: Random House Australia.
- Herrington, A., & Herrington, J. (2006). What is an authentic learning environment? In A. Herrington & J. Herrington (Eds.), *Authentic learning environments in higher education* (pp. 1-13). London, UK: Information Science.
- Hussey, T., & Smith, P. (2008). Learning outcomes: A conceptual analysis. *Teaching in Higher Education*, 13(1), 107-115. doi:10.1080/13562510701794159
- Jervis, L., & Jervis, L. (2005). What is the constructivism in constructive alignment? *Bioscience Education*, 6(1), 1-14. doi:10.3108/beej.2005.06000006
- Jonassen, D. (1997). Instructional design models for well-structured and ill-structured problem-solving learning outcomes. *Educational Technology Research and Development*, 45(1), 65-94.
- Jonassen, D., Peck, K., & Wilson, B. (1999). *Learning with technology: A constructivist perspective*. Upper Saddle River, NJ: Prentice Hall.
- Joseph, S., & Juwah, C. (2012). Using constructive alignment theory to develop nursing skills curricula. *Nurse Education in Practice*, 12(1), 52-59. doi:10.1016/j.nepr.2011.05.007
- Larkin, H., & Richardson, B. (2013). Creating high challenge/high support academic environments through constructive alignment: Student outcomes. *Teaching in Higher Education*, 18(2), 192-204. doi:10.1080/13562517.2012.696541
- Lofland, J., & Lofland, L. (1995). *Analyzing social settings: A guide to qualitative observation and analysis* (4th ed.). Belmont, CA: Wadsworth Thomson.
- Long, P. (2013, October). *ePortfolios in the new world of learner driven pathways*. Paper presented at the Digital Identities, Footprints, and Networks 2013 ePortfolio Forum, Canberra, Australia.
- McKenzie, A., Morgan, C., Cochrane, K., Watson, G., & Roberts, D. (2002, July). *Authentic learning: What is it, and what are the ideal curriculum conditions to cultivate it in?* Paper presented at 25th HERDSA Annual Conference, Perth, Australia.
- Miller, G. (1990). The assessment of clinical skills/competence/performance. *Academic Medicine*, 65(9), 63-67. doi:10.1097/00001888-199009000-00045
- Niemi, P. (1997). Medical students' professional identity: Self-reflection during the preclinical years. *Medical Education*, 31(6), 408-415. doi:10.1046/j.1365-2923.1997.00697.x
- Ramsden, P. (2003). *Learning to teach in higher education*. New York, NY: Routledge Falmer.
- Schön, D. (1987). *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass.
- Tochel, C., Haig, A., Hesketh, A., Cadzow, A., Beggs, K., Colthart, I., & Peacock, H. (2009). The effectiveness of portfolios for post-graduate assessment and education: BEME Guide (No. 12). *Medical Teacher*, 31, 320-339. doi:10.1080/01421590902883056
- van der Vleuten, C., Schuwirth, L., Driessen, E., Dijkstra, J., Tigelaar, D., Baartman, L., & Van Tartwijk, J. (2012). A model for programmatic assessment fit for purpose. *Medical Teacher*, 34(3), 205-214. doi:10.3109/0142159X.2012.652239
- Van Tartwijk, J., & Driessen, E. (2009). Portfolios for assessment and learning: AMEE Guide No. 45. *Medical Teacher*, 31(9), 790-801. doi:10.1080/01421590903139201

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Appendix A
Focus Group Questions

1. Did the portfolio system help you to be more efficient as a learner? Yes/No, why?
2. How would you rate the ease of use and intuitiveness of the portfolio system?
3. We are interested in your perceptions of the features of the portfolio system (e.g., linking to other tools like the journal or the blog). To what extent did they assist you in your learning?
4. Do you believe that the portfolio systems enhanced your reflective capabilities? Yes/No? Why?
5. Do you believe that the portfolio systems enhanced your propensity to collaborate with others? Yes/No? Why?
6. To what extent did the portfolio system enhance your ability to share your work and gather feedback?
7. Did you feel that the artifacts you uploaded to the ePortfolio were secure? Yes/No? Why?
8. Would you prefer to use an ePortfolio in the future as you progress through your university studies? Yes/No? Which platform? Why?

For each individual in the group:

9. On a scale of 1-10 ,where 1 is the lowest and 10 is highest, rate the overall functionality of the ePortfolio platform.

Appendix B
Tutor Interview Questions

1. Did the portfolio system help you to be more efficient as a tutor? Yes/No, why?
2. How would you rate the ease of use and intuitiveness of the portfolio system?
3. We are interested in your perceptions of the features of the portfolio system (e.g., journal, blog, planning tool). To what extent did they assist you in being the best CD tutor that you can be?
4. Do you believe that the portfolio system enhanced students' reflective capabilities? Yes/No? Why?
5. Do you think that the portfolio system enhanced students' propensity to collaborate with others? Yes/No? Why?
6. To what extent did the portfolio system enhance students' ability to share their work and gather feedback?
7. How would you rate the security of the ePortfolio system?
8. Would you prefer to use an ePortfolio in the future in your teaching? Yes/No? Which platform? Why?
9. On a scale of 1-10, where 1 is the lowest and 10 is highest, rate the overall functionality of the ePortfolio platform.