

The Curricular and Technological Nexus: Findings From a Study of ePortfolio Implementation

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This paper presents findings from a qualitative study of ePortfolio experiences among health professions students at a major Australasian research-intensive university. This exploratory study of the scholarship of teaching and learning (SoTL) aims to understand the experiences and perspectives of students introduced to program-level ePortfolios across multiple curricula in the health sciences. Six key themes emerged from the data: benefits of an ePortfolio at the curriculum level, ePortfolios as an enabling technology, the value of reflection, the role of user support, the speed and quality of feedback, and mitigating distance and isolation. These data show that a program-level strategy that embeds ePortfolios across a curriculum, including delivering assessable tasks in the ePortfolio platform, is beneficial to students when a scaffolded, structured approach is taken.

ePortfolios, digital professional portfolios, are increasingly common tools in professional health education. ePortfolios have a significant potential to promote student responsibility for the self-regulated development of professional skills and knowledge (Biggs, 2006). They have been found to improve communication about expectations and feedback as well as to promote reflective thinking (Emmett, Harper, & Hauville, 2005; Howatson-Jones, 2004). However, ePortfolio implementation has been met with varying degrees of success (Endacott et al., 2004).

This study is related to a faculty-wide ePortfolio selection and implementation project that began in 2012. Our faculty is a large health sciences faculty located at a major research-intensive university in Australasia. Undergraduate professional programs in medicine, pharmacy, nursing, population health, medical science and optometry, and postgraduate programs (certificate, diploma, masters) in medical and health sciences were using either portfolio-based assessment or had ambitions to do so prior to selecting what would be a faculty-wide ePortfolio tool.

After an extensive selection process (Egan et al., 2015; Egan, Cooper-Ioelu, Spence & Petersen, 2015), Chalk and Wire was selected as our ePortfolio system. ePortfolio-based assessment was subsequently implemented on a staged basis across multiple programs. Support was delivered by a team of learning designers from our educational services unit, which is embedded within the faculty.

Literature Review

Scholarship related to ePortfolios has expanded significantly. Almost a decade ago, Timmins and Dunne (2009) described how paper-based portfolio assessment could include weighing and measuring the size of the final hard copy of a paper-based portfolio.

The field has evolved to emphasize the quality of work over volume.

Peet et al. (2011) offered a conceptual framework for understanding ePortfolio development: lifelong learning capacities focused on metacognitive skills, life-wide learning capacities of specific “how-to” knowledge in and across specific contexts, and critical reflexive capacities, including the ability to continually reflect as a learner within specific learning and work contexts. Jenson (2011) described a project where writing students used ePortfolios. Arguing that some students wrote “longer, not more reflective” (Peet et al., 2011, p. 50) statements in some instances, word count did “speak to the seriousness with which students approached the task of reflection” (p. 55). Jenson (2011) articulated a continuum of student writing, from naming to naming and describing to identifying learning outcomes to identifying self-regulated learning strategies.

Ehiyazaryan-Whiter (2012) reported on the benefits of using ePortfolios in a postgraduate education program in her action research project. She found student posts evolved from “how-to’s,” toward sharing successes, failures and uncertainty, toward revealing deeper approaches to learning. Pitts and Ruggirello (2012) examined ePortfolio as a discursive space “that afford users the capacity to analyze and illustrate growth within the discourse and standards of a community” (p. 50). They offered an assessment framework based on the use of evidence, the application of a (relevant) conceptual framework, and the extent to which overall ePortfolio development articulates growth. Applying the performance indicators of under-developed, good and excellent became the basis of an assessment rubric for students’ ePortfolio work. Cross (2012) reported on an ePortfolio for overseas trained teachers (OTTs) seeking registration in Australia. The ePortfolio project “required OTTs to create their own ePortfolios by following a structured and staged process” (Cross, 2012, p. 44);

however, few candidates in the first cohort moved on to successful registration.

O’Keeffe and Donnelly (2013) identified multifaceted challenges for students developing an ePortfolio: understanding the purpose, understanding the requirements, using specific ePortfolio technology, using multimedia to present information in diverse ways, and managing the time-intensive work of creating, curating and synthesizing an ePortfolio.

Parkes, Dredger, and Hicks (2013) described an ostensive four-step process for creating an ePortfolio: collect, select, reflect, and connect, though the advanced work required to configure an ePortfolio arguably is an initial (fifth) step: erect. In creating a learning activity that was ostensibly student-centered they nonetheless found that “students had different levels of aptitude for thinking and writing reflectively” (Parkes et al., 2013, p. 107), which seemed to impact the calibre of their ePortfolio work.

Richards-Schuster, Ruffolo, Keyda Nicoll, Distelrath, and Galura (2014) described an example case demonstrating ePortfolios used as an assessment platform and for gathering evaluative feedback from students enrolled in a civic engagement minor. Eynon, Gambino, and Török (2014) identified the potential for ePortfolios to “play a vital role in the evolution of higher education” (p. 111), particularly when integrative ePortfolios are used to “build student success, deepen student learning, and catalyze institutional change” (p. 111). Wuetherick and Dickinson (2015) explored continuing education (or university extension) students’ perceptions of ePortfolio use. They found that the convenience of working online was mitigated for some older students, who more often struggled with the online modality to the extent that it negatively impacted their ePortfolio experience.

Gordon (2017) described how language learners could use an ePortfolio to bridge the gap between course content and language usage outside of the classroom, as well as considering the extent to which these learners benefited from peer review and feedback. Singer-Freeman and Bastone (2017) reported on two related studies in their paper. For the first study, they proposed that ePortfolio word count could be equated with the quality of student work. They found students who worked online versus those who used a paper-based worksheet wrote much more extensively with respect to concepts, reflection and planning, acknowledging that “students’ preference for typing over [hand]writing” (Bastone, 2017, pp. 153-154) might account for this. For the second study, where students either submitted word processed papers or completed an ePortfolio, word counts related to concepts and reflection decreased, while word counts related to planning increased.

Morreale, Van Zile-Tamsen, Emerson, and Herzog (2017) evaluated a pilot capstone ePortfolio project for

third-year undergraduate students. The data showed that capstone ePortfolio experiences “can be valuable in giving students a chance to integrate . . . [learning and] . . . offer excellent opportunities for students to reflect on their undergraduate careers” (Morreale et al., 2017, p. 22). Bryant, Zeh Rust, Fox-Horton, and Johnson (2017) offered best practice recommendations for ePortfolio implementation with non-traditional university students. Using ePortfolios can “heighten levels of hope, improve students’ abilities to integrate knowledge from two or more disciplines, and help student link their learning to career skills” (Bryant et al., 2017, p. 136). Thibodeaux, Cummings, and Harapnuik (2017) looked at factors that could explain persistent use or discontinued use of ePortfolios. The minority of students (17.7%) who persisted in using ePortfolios post-program experienced “considerable choice over the learning process, combined with elements of voice, authenticity, and ownership of the process” (Thibodeaux et al., 2017, p. 8).

Chittum (2018) created an ePortfolio learning activity to “facilitate deeper thinking processes . . . enable more meaningful connections between the content and practicum experience, make the assignment more useful” (p. 30) in the future. She found no significant difference with regards to some motivation constructs in ePortfolio and non-ePortfolio student cohorts, but significant positive differences concerning perceived usefulness in class and academic performance. Weber and Myrick (2018) identified themes related to reflection and feedback—enjoyment of the project, tracking of achievements to enhance motivation, pride in intellectual and personal growth, appreciation of feedback—along with challenges around the aesthetics of an ePortfolio.

ePortfolios in Health

ePortfolios have gained increasing prominence in professional health sciences programs—particularly in nursing education. Peacock, Murray, Scott, and Kelly (2011) examined student experience across a range of health-related disciplines, including radiography, physiotherapy and nursing, with consideration of the product (assessable tasks) and process (experience) of learning. Participants were “very positive about receiving tutor-generated feedback on the product of their learning through the ePortfolio” (Peacock et al., 2011, p. 43). Learning engagement levels were variable, because “learning engagement with the ePortfolio for both purposes (process and product of learning) was linked to their understanding of what feedback was and what they believed to be their role within the feedback process” (Peacock et al., 2011, p. 43). Peacock et al. (2011) recommended that ePortfolios be “integrated into the curriculum with full technical and pedagogical support available” (p. 44).

Bate, Macnish, and Skinner (2016) looked at Aboriginal health first-year medical students' experiences with ePortfolios delivered either within Blackboard or via Mahara. Most students were "unimpressed by the potential . . . to engage more deeply with the curriculum" (Bate et al., 2016, p. 87) and placed "little value on portfolio tasks in the development of their identity as a doctor" (p. 88). Chan (2012) evaluated the use of ePortfolios in a Physical Therapy Assistant program where a "balanced curriculum that develops professional competencies in students while preparing them for the licensing examination" (p. 149). He argued that an ePortfolio transcends a mere assessment platform and becomes "a pedagogical tool that encourages students to look beyond their education as merely a test-prep workshop or job training" (Chan, 2012, p. 161).

Landis, Scott, and Kahn (2015) looked at a broad range of ePortfolio projects across multiple disciplines, including nursing. They found instructors were often surprised at their students' difficulties with reflection. Josephsen (2012) evaluated the use of the webware program PBWorks as an ePortfolio platform for her blended modality Bachelor of Science (Nursing) students. While the use of ePortfolios was reported as having a number of advantages, some students continued to struggle with the platform if they lacked strong computing skills prior to enrollment in the program. Garrett, MacPhee, and Jackson (2013) evaluated how an ePortfolio was used to assess clinical competence in a Bachelor of Nursing program. They found technical issues were minor, with more concerns "related to pedagogy and use of competence based assessment" writ-large (Garrett et al., 2013, p. 1210). They saw using an ePortfolio "as a natural evolution of paper-based clinical assessment systems, having considerable advantages in terms of convenience, transparency and consolidation of learning" (Garrett et al., 2013, p. 1212).

In nursing, Bogossian and Kellett (2010) similarly reported on barriers to ePortfolio access in nursing clinical settings. When seeking to migrate from paper-based to digital portfolios their students and staff encountered barriers to accessing computers, finding time during clinical placements, and clinical staff attitudes about portfolios. Andrews and Cole (2015) identified "hurdles" nursing undergraduate students encountered when working in an ePortfolio space: access to pedagogical support, technical support, general IT literacy levels, computer and internet access, staff reluctance (impacting student efforts for support), "limited scope or perspective of ePortfolio pedagogy" (p. 57), and a lack of software knowledge.

More recently, Birks, Hartin, Woods, Emmanuel, and Hitchins (2016) also highlighted technical issues as a significant barrier for both undergraduate nursing and

postgraduate midwifery students. Only one-third of participants thought their ePortfolios might be beneficial in seeking employment, though almost half agreed they developed important professional skills while collating their ePortfolios. As well, "a trend was observed between age and perceptions of enhanced learning" (Birks et al., 2016, p. 49), where most of the students who found that the ePortfolio enhanced their learning were 30 years old or younger. Collins and O'Brien (2018) evaluated the impact of ePortfolio-based learning activities in a Bachelor of Nursing program. A plurality of students reported an increase in reflective learning; a majority felt they received enough feedback via their ePortfolios to improve their practice (Collins & O'Brien, 2018, p. 46). However, several students expressed concerns about the quality of feedback received.

What emerges from the literature is that ePortfolios can be a useful tool that drives learning, but only when educators critically and deeply reflect on how ePortfolios are designed and integrated into courses and programs. ePortfolios have the potential to stimulate deep reflection that can rival paper-based alternatives (particularly in professional disciplines) when they are well-scoped and supported. For ePortfolios to be an effective learning tool, students need to appreciate how ePortfolio tasks connect to other areas of the curriculum and their future professional practice.

Method

This exploratory, qualitative study of scholarship of teaching and learning (SoTL) aimed to understand the experiences and perspectives of students who engaged in ePortfolio learning in one of multiple curricula in the health sciences. This qualitative study (Bernard, 2012) included key informant interviews with university students ($N = 15$) who have been involved in ePortfolio-based teaching endeavours in one of our relevant faculty academic programs. The inclusion criteria were current or recent university students affiliated with one of the programs that used our new ePortfolio system.

Eligible participants were recruited from undergraduate programs in nursing, optometry, pharmacy and medicine. Program and course coordinators sent out an e-mail invitation to cohorts of students in each program using our ePortfolio system. Between May and November 2016, students were invited to participate in an interview of up to 60-minutes, from which a verbatim transcript would be generated. Participants were given the right to refuse to answer any individual questions and to withdraw from the study at any time without penalty; none made any changes to their transcript or withdrew from the study. All student participants were given a \$20 (New Zealand

Table 1
List of Participants

Participant	Program
Ngairé	Bachelor of Pharmacy
Neil	Bachelor of Pharmacy
Theresa	Bachelor of Pharmacy
Eric	Bachelor of Pharmacy
Jane	Bachelor of Pharmacy
Elyse	Bachelor of Optometry & Vision Science
Robert	Bachelor of Nursing
Charlotte	Bachelor of Nursing
Erin	Bachelor of Nursing
Michelle	Bachelor of Nursing
Ines	Bachelor of Medicine, Bachelor of Surgery
Marie	Bachelor of Medicine, Bachelor of Surgery
Anna	Bachelor of Medicine, Bachelor of Surgery
Arthur	Bachelor of Medicine, Bachelor of Surgery
Dan	Bachelor of Medicine, Bachelor of Surgery

Note. All participant names are pseudonymous.

dollar) supermarket gift card for their participation. The University's Behavioural Research Ethics Board approved this study design.

The research questions were:

- What are the experiences of students with ePortfolios at the curricular (or program) level?
- What are their perspectives with respect to the value of ePortfolio-based learning activities?
- What sorts of opportunities or challenges are experienced when working with ePortfolios?

The implications of these findings for curriculum development in health professional education were considered.

All interviews were recorded using a digital voice recorder. A professional transcriptionist transcribed each interview verbatim. Participants who provided an e-mail address were sent their transcripts for review and potential revision: none elected to revise the transcripts. We analyzed the transcripts using Atlas.ti qualitative data analysis software. Data were analysed naturalistically (Lincoln & Guba, 1985; Strauss & Corbin, 1998) using the constant comparative method (Glaser & Strauss, 1967).

The focus of this study was not to measure specific educational outcomes or academic performance levels—both of which would be difficult to disaggregate from other aspects of students' teaching and learning activities—nor to examine the potential role ePortfolio-delivered assessment can play. Rather, we wanted to examine the interplay between curriculum, teaching, and learning from the perspectives of students. Table 1 lists the participants and their programs of study.

Results

There was no unanimity of experience or perspective across the participants. Experiences varied among them, including those enrolled within the same academic program. There were, however, significant trends in participants' perspectives, in terms of the themes addressed. Within these themes there was also some variability among participants' accounts.

Six key themes emerged in our analyses: (a) benefits of an ePortfolio at the curriculum level, (b) ePortfolios as an enabling technology, (c) the value of reflection, (d) the role of user support, (e) the speed and quality of feedback, and (f) mitigating distance and isolation.

Curriculum

When we developed this research project we were keenly interested in the extent to which students might find value in ePortfolio integration of their experience at the curricular (or program) level, rather than at the course or learning activity level. We anticipated that students “at the coal face” of university study would be very task- and assessment-focused, to an extent that might disincentivize more in-depth considerations of their overall program-level experiences, including the ePortfolio. However, our assumption proved to be misplaced. Most respondents were exceedingly sophisticated in their understanding that their ePortfolio was a program (rather than course level) experience. Of the 15 students interviewed for this study, only one (Theresa) had no idea why an ePortfolio was used in the program.

Students from programs that utilized multiple affordances of the system described much more positive experiences with their ePortfolios. Erin’s description of how Chalk and Wire was deployed worked well at the program level:

I found it really helpful for me, just the way it works. I really felt good about using it because all my friends from the year before haven’t had a chance to use [an ePortfolio]. All my friends were saying it’s really good that we have this improved way of handing in [our] portfolio. They had some struggles communicating with the lecturer, or getting a feedback from the lecturer, especially in the middle placement that we have in the last semester of the curriculum. That’s a long one.

It’s quite important that we get a lot, like as much feedback as we can get from the lecturer. Because they are experienced, and they know better than us, obviously. So, I guess I look forward to using it [next year] because I have already benefitted, I got a lot of benefit from using it in the placement, even in the short one.

Erin’s analysis of her initial experience with Chalk and Wire already had her thinking about its applicability in the following year of her program. Michelle summarized the global benefit she experienced using Chalk and Wire. She found it “just makes you think about certain situations and makes you understand things that you wouldn’t have before. With reflective practice it definitely brings that to the program much more.”

Enabling Technology

Some respondents described ePortfolio benefits mostly in instrumental terms, in ways that delineated efficiencies in completing extant tasks or activities. For instance, Robert found using an ePortfolio “easier than e-

mailing back and forth a Word document.” Anna thought that moving to an online portfolio is “probably just keeping up with the times, really,” which she thought her program and the university “could do more of”.

While Elyse did not find using Chalk and Wire detrimental, she also felt that perhaps the ePortfolio tool was not leveraged as much as possible:

For what we did last year, not really, but if there was a lot more stuff on there... what they gave us essentially could have just [been] given as a printout, they could have just given us a printout and told us to submit it back. I can see how that interface could be used to do a lot more, but we didn’t really do that.

Several of the participants indicated that using an ePortfolio changed—and improved—their student experiences, including how they approached their learning. Ngaire described how Chalk and Wire allowed her to capture an experience iteratively and subsequently reflect on it:

For me it is different. I really enjoy the reflection part, so the reason for that is that if I do a reflection I note down what happened during the day, and one mistake I made, and what improvement I made during the day. [I found] it quite helpful, to push me going.

For Ngaire, having a central place where much of her work related to clinical placements was, in particular, useful. Similarly, Neil liked how his ePortfolio “shows the evolution of our learning over time, so I think we are using the portfolio for our third and fourth year, so probably by the end of it the benefits of it, my learning, will be more apparent.”

Anna found that the granularity of her program’s Chalk and Wire template, combined with online access, facilitated learning:

The organisation, of knowing where everything is, and grouping everything together, because I am a very “categorisation” sort of person, [the ePortfolio] works quite well for me. The other thing I was thinking about before is being able to access it anywhere, whereas if you get a [paper] folder of things sitting in your flat, they’re not any use to you when you’re at uni and you need to access them. So, the online stuff is fantastic for that.

Elyse shared a similar perspective. She found the Chalk and Wire end-user experience a significant improvement over another learning technology tool, the university’s in-house learning management system (LMS). She found the LMS interface “was just so annoying that having a

nice website like Chalk and Wire actually made everything a bit easier.” As ease of use was a key element of our ePortfolio selection criteria, these accounts were affirming. Erin also found the online access enabling, as much for how it facilitated feedback while on a clinical placement offsite:

You can do whatever writing you need to do and then you can just save it, upload it. The clinical lecturer, who sees our portfolio, they can give us constant feedback for our portfolio. Last year I had to send the Word document every week and then they give a bunch of feedback for the week. Then we go on and then improve or add stuff and then they give us a reply back a week later.

While using Word and e-mail offered a similar task protocol, the ease of use in the ePortfolio workflow made both the work and the feedback more accessible for Erin. Similarly, Michelle described how using Chalk and Wire iteratively provided “an opportunity to share what you’ve done with your lecturer without actually talking to them, then they give you feedback on it and talk about how you reacted to it.” Michelle’s description of the text-based interaction as “talk” is worth highlighting: it indicates the communicative aspects of the undergraduate nursing ePortfolio—which to a significant extent were designed to mitigate isolation during clinical placements—was successful.

However, for some participants, an ePortfolio was viewed neutrally or negatively. Marie thought using Chalk and Wire “made it more complicated, just because it’s just a portfolio for the portfolio itself.” Neil found navigating Chalk and Wire unnecessarily complex:

Well, just in terms of the way it is designed. I feel it was kind of awkward to navigate. There is a list of contents, a home page and you click on it and it would be within the same browsing window, but you would have to scroll up, sort of like this thing comes out from the side and it’s got all the questions and you’ve got to click on it and it comes up with all the questions. I feel it would be easier to navigate if every time you clicked on the thing that you were going to, it opened up a new tab.

In terms of the selection of our ePortfolio system, none of the products we reviewed offered a tabbed interface unless each transaction opened into a new browser window. While savvy end-users can elect to have new windows open as tabs, for others, the opening of multiple new windows was viewed negatively during our piloting of two shortlisted systems. There was no sophisticated ePortfolio system with tabbed browsing as its default. Having to scroll down within a single screen

was determined to be preferable over managing multiple browser windows concurrently during a single session.

Anna’s experience indicates other aspects might have contributed to some students’ challenges with Chalk and Wire:

It was mainly that there was no introduction to it. I didn’t even know where to find it on the internet. I just typed in “Chalk and Wire” and hoped for the best. So, the introduction by [staff] probably wasn’t the best. They could have done a little bit of “here’s how to find it, here’s how to navigate around it”, because, had [this] been explained, it probably wouldn’t have been a problem. Because we would have known where to find everything.

Students like Marie, Neil and Anna, who did not have a positive perspective on their ePortfolio experience, consistently described that a perceived lack of value in the tasks required to complete their ePortfolio denuded its pedagogical value as did the lack of facilitated access.

Value of Reflection

A key driver in our faculty’s decision to select an ePortfolio tool was to enable reflection among our professional students, particularly those who would be seeking registration or licensure upon graduation. While the nature of reflection varies somewhat between our programs, the expectations around program-level facilitation of reflective practice were similar across all four programs. Based on Schön’s (1987) work, we endeavored to produce early career health professionals who are skilled at *reflecting on* and *reflecting in practice*.

The extent to which Chalk and Wire enabled this sort of reflection was, on the whole, substantive. Most participants articulated either the value of having an ePortfolio for reflection or described specific ways that completing their ePortfolio enabled reflection. Robert explained how he was already anticipating how reviewing his ePortfolio will facilitate his transition from student to working nurse:

[It] makes me realise that actually when I come to the end of three years and I need a portfolio of some description to give to my employers or I need to show evidence of reflection in practice, it’s all in one spot, which wouldn’t have been the case with Word documents. They probably would have been lost somewhere on my computer by then.

Lisa, also a nursing student, described how using Chalk and Wire facilitated reflection:

[using the ePortfolio] just makes you think about certain situations and makes you understand things that you wouldn't have before . . . reflective practice, it definitely brings that to the program much more, I think, particularly with things like cultural competence. It brings that to the curriculum because we don't necessarily have assignments based on that but the portfolio kind of brings those sorts of things.

Lisa described both reflecting on (after events) and reflecting in (during events) and why working iteratively, with faculty feedback and support, accelerated her development of reflective practice competencies. However, students like Arthur seemed to find the emphasis on reflective practice challenging:

Yeah, I understand that once we start hitting the clinical years it would be good—and it's important—to reflect but at this stage we haven't really done anything clinical. I am continually reflecting in my head. I don't need to write it down on paper. It just increases stress.

Charlotte found using Chalk and Wire “really handy for reflective, for reflection in your own practice and just seeing what we have done and how [it] could be used to see what we do better next time or to define key learning needs.” Michelle perceived using an ePortfolio as “really helpful”:

Oh yes, it's helped because we've had to do some reflection assignments, which have been like a whole assignment on reflection. It's helped with those for sure. You've got the examples in your head already, so you can kind of just get them out.

Getting examples of things upon which to reflect “out” of her mind into words facilitated Michelle's reflection.

Dan initially captured content for his ePortfolio “outside” (in Microsoft Word), though he entered things directly into Chalk and Wire more often over time:

It was a bit of both. So, this year I started a lot of things outside Chalk and Wire. Like I have done my own reflections, which I am going to go back into Chalk and Wire and see where I can integrate them.

What Dan described was metacognitive learning: self-regulated learning activities (Biggs, 2006) that a student employs to facilitate their own learning.

Role of Support

Given our relatively small, six-person educational services unit team, we were unable to staff a telephone-

based help desk in support of Chalk and Wire. As a faculty-specific tool we were also unable to integrate our support needs into the wider university's user support ecosystem. Thus, we focused on four levels of locally provisioned support:

- Extensive work with staff to develop and refine each program's ePortfolio template.
- A hands-on demonstration in each program at the beginning of the term when ePortfolios are first introduced.
- Bespoke user guides for each program, with specific guides each for students (and staff).
- An e-mail address for Chalk and Wire support requests, monitored during core university working hours.

Overall our approach seemed to work well. We were keen, however, to ascertain students' perspectives on support levels and their effectiveness. The amount of technical support required by the participants varied significantly. Around half of the students either needed no technical support or did not seek any support when they encountered challenges or difficulties. Some, like Ines, asked their friends for assistance with any problems. Eric replied “No, I'm a male. Who does that, unless stuck?”

Robert, Charlotte and Michelle all found an in-class demonstration of Chalk and Wire at the beginning of term very helpful. As Charlotte described:

It was helpful with the lady that came in every time we started placement where she reminded us how to do the set up. But after doing it a couple of times you kind of learnt quickly what need to be checked and what need to be unchecked.

The demonstration, combined with often repetitive tasks, enabled Charlotte to develop the skills required to use Chalk and Wire to complete her work.

However, some of the more interesting responses came in response to the bespoke user guides. Robert, for example, was able to complete his work without reviewing the user guides because of the demonstration session, as was Elyse. Theresa “just followed” the guides, which were transaction-focused, and had no need for further assistance. Two participants' accounts—Michelle's and Anna's—delineated two very different experiences with the user guides for some participants. Michelle's experience reflected our intentions in creating these guides:

Interviewer: And where did you go to get that assistance?

Michelle: They kind of made this massive document with all the help we might need on it so

looked at that and then I think I had to e-mail a lecturer once, or one of our administrator people, and then they told me what to do.

Interviewer: That big guide that you got, how was that, was that useful?

Michelle: Yeah it was useful. Just took a while just to find what you were actually looking for, but yeah, it was okay.

The user guide, along with support from her lecturer and other university staff, were sufficient for Michelle to successfully use Chalk and Wire. Anna's experience was different:

Interviewer: Did you have any need for technical support or assistance at all?

Anna: No, I think I was alright in the end actually. I just kind of uploaded things and hoped that they ended up in the right place.

John: Did you find the user guides that were created of any use?

Anna: Didn't know that there were user guides.

Interviewer: We created a user guide for you folks, specifically for [your] program.

Anna: I never saw that. That probably could have been quite helpful.

Several students in Anna's program reported not having received user guides nor being made aware they were available.

Overall, students who recalled receiving these guides found them useful, though some found the guides were somewhat detailed and dense. Having access to—and perhaps being directed when to use—the user support materials developed for their program might have led to a more positive user experience.

Our team received (to our support e-mail address) relatively few user-support requests. Most related to user ID and password or other account-level issues, rather than the use of Chalk and Wire itself. We attribute the relative paucity of requests for troubleshooting to the efficacy of the other elements of our four-point user support system.

In programs where Chalk and Wire was embedded persistently through a range of assessed and non-assessed learning activities, students described their experiences more positively (and using an ePortfolio more valued) than in programs that used a more “hands off” approach. Karla did not experience Chalk and Wire embedded across her program's curriculum:

We never really used it until the end of the year and obviously it gets put off and put behind, all the tests and everything we are going through. So pretty much most of us that are using, I know with my friends, we only knew how to use Chalk and

Wire two days before submission because we already had all the content anyway and it was just more of uploading it or pasting it into the portal. Yeah so, we didn't really spend that much time on it.

Most other programs took a scaffolded and embedded approach to using Chalk and Wire: their students more often described Chalk and Wire as more relevant and useful. Therefore, how an ePortfolio is embedded across and within a curriculum seems to significantly impact students' experiences.

Mitigating Distance and Isolation

A key element of pre-service health profession education involves clinical placements, which are routinely delivered at non-university sites in the community, including (for our programs) hospitals, community pharmacies and health clinics. While these placements are considered exceedingly important in developing professional competencies, some students struggle with a sense of isolation from their program and university while on placement, particularly extended placements.

In particular, Several nursing student participants found that using Chalk and Wire as an iterative assessment and communication platform assuaged their sense of isolation during placement. For example, Michelle said,

I guess you are getting the instant feedback and the lecturers can monitor your work quite often, because then we don't have to send all these e-mails. I think you can save some time because, if you just go on Chalk and Wire you can see without sending a separate e-mail to say “I did this, can you check please” because we keep constantly checking. I think it's good for students to get this constant feedback which you can work on in the clinical setting. When we are in the placement, not after we finished the placement.

Staff in the Bachelor of Nursing program chose to strategically leverage Chalk and Wire's “collaboration” affordances for students out on clinical rotations, to significant effect. While supporting students as they configured these elements of their ePortfolios was somewhat complex, the benefits seemed to outweigh the onboarding challenges.

Speed and Quality of Feedback

When participants were asked why Chalk and Wire had been implemented at the curricular level, the most common reason surmised was to make assessment and feedback more efficient. Charlotte described some of the efficiencies related to ePortfolio use:

I think it's just so easy for them to mark because then everybody will then have their set up portfolio and it's not sort of like a hard copy where you have to submit and then they have to go through a file, so it's just easy. It doesn't take up any physical space. It's better for the environment and it's just easier to refer to. So, if you happened to have internet access and a connection then you can just go and have a look at it whenever.

Charlotte's experience was similar to several other participants. In using a digitized workflow, turn-around times for assessment were often reduced through both the elimination of paper-based submissions and the leveraging of tool affordances like rubrics, assessor pools, and online assessment moderation.

Friendly Advice

Our last interview question for the participants was offered as a sort of capstone question about their ePortfolio experience. It also plugged into the sort of task focus students have while at university: What one piece of advice would you give other students about to start using an ePortfolio? Rather than emerging as a theme from the data, these direct responses to a particular question were relevant and valuable to both instructors and students.

Their responses varied widely. Some focused on aggregating evidence, others on the tool's affordances and others on how they approached learning writ large. Ngaire encouraged other students to treat their ePortfolios "as a diary," which would help students "figure it out themselves." Theresa suggested they review their portfolio's requirements in advance "so you know what to do pre-work and post work and just stay organised." Similarly, Ines thought early access was key to success. She found using an ePortfolio "really great" and wished she had spent a bit more time early on. Had she followed her own advice, she perhaps would not have experienced "a panicked frenzy when the time comes to actually submit [her] work." Marie, Dan, and Anna also thought earlier access was best.

Neil encouraged copious capturing of placement experiences, as writing down "heaps of notes" would "make answering the portfolio so much easier." Arthur, conversely, discouraged uploading evidence (as attachments) because "at the end of the year you just sum it up and turn it in."

Charlotte suggested students "structure and format [it] just to get an idea in what you need to write about" and to "use the communication tool." In other words, plan ahead and use the ability to feed back and forward with your instructors through the platform. In addition, Michelle suggested, "take your time to plan out what you are going to write rather than just blurring it out."

Discussion

These data show that a program-level strategy that embeds ePortfolios across a curriculum, including delivering some assessable tasks in the ePortfolio platform, can be beneficial for students and staff.

In programs where Chalk and Wire was embedded persistently through a range of assessed and non-assessed learning activities, students described their ePortfolio experiences more positively than in programs that used a more "hands-off" approach. The undergraduate pharmacy and nursing programs took a scaffolded and embedded approach: their students more often described Chalk and Wire as relevant and useful than those studying medicine or optometry and vision science. Therefore, how an ePortfolio was embedded across and within a curriculum seems to have significantly impacted students' experiences.

Challenges for students were more often related to the time required for upskilling and onboarding with the new system. Opportunities included having a central repository for program-related collateral and the potential for migrating elements of a program-related ePortfolio to a professional ePortfolio or curriculum vita when entering the job market.

Broadly speaking, participants had a substantive understanding of the curricular aspects of their ePortfolio work. Most viewed their work as program-level rather than course-level, though course-specific elements of their ePortfolios were often the foci. This reflects the task-focus of university students in managing their workload.

Limitations

This study is qualitative in nature and the findings are therefore not generalizable. While a range of professional programs are represented in the data set, these are all programs that produce early career health professionals: the ePortfolio requirements were driven largely by the professional competency frameworks for these particular professions. Thus, the relative transferability of this study should be considered.

The New Zealand higher education system, however, is not dissimilar to that of Australia, Canada, the United Kingdom, or the European Union (EU). Universities are public institutions with student places subsidized on a per-student basis. Unlike much of the EU, New Zealand universities have, until recently, charged students tuition and fees to study. Beginning in 2018, any first year of tertiary study is fully funded by the government so long as the student has not previously enrolled in any tertiary program.

Pre-registration programs for physicians, nurses, pharmacists, and other health professions can vary from jurisdiction to jurisdiction. To a significant extent it is

feasible for New Zealand-trained health professionals to transfer their registration to these other parts of the world. There is significant coherence between Australia and New Zealand; there are professional peak bodies in each country, but the overall accreditation requirements for these programs are very similar. There can be, however, differences in how things are taught at different universities.

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