Pharmacy students' perceptions of ePortfolios in pharmacy education

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Abstract

Aims: To investigate perceptions of an ePortfolio structure, its utility to support pharmacy student learning, development of reflective capacity, and attainment of professional competencies.

Methods: Mixed-methods two-phase study: Phase 1 (Quantitative): pre- and post-use, 6-item student survey; Phase 2 (Qualitative): 45-minute student focus group.

Results: Survey (n=49, RR 82%) and focus group respondents (n=12) provided their perceptions of ePortfolios. Statistically significant findings between Week 1 and Week 14 indicated that in addition to a time consuming exercise, students perceived that the current structure of the ePortfolio did not fully support their learning; development of their reflective capacity; self-directed learning skills; and professional practice.

Conclusions: Pharmacy students perceived the ePortfolio needed improvements to reach its full potential. Students indicated that maintaining an ePortfolio is a useful tool to track professional competencies, linking digital evidence and reflections. Proposed suggestions were identified for improvement that would enable them to meet curricular competencies.

Keywords: *Portfolios, Professional Competency, Reflection*
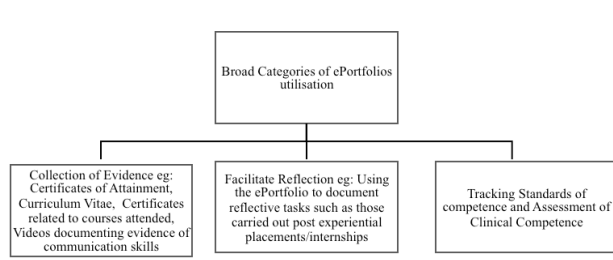
Introduction

The use of electronic portfolios (ePortfolios) as learning and assessment tools has become widespread across pharmacy and many other health professions (Plaza *et al*., 2007; Briceland & Hamilton, 2010; Dawn *et al*., 2011; Saltman *et al*., 2012; Garrett *et al*., 2013; DiVall *et al*., 2014; Green *et al*., 2014; Birks *et al*., 2016; Lucas, 2016). While there is a growing body of literature related to ePortfolios and their value, there is limited research that examines the effectiveness of the educational impact of the use of ePortfolios. Furthermore, there is a paucity of research related to ePortfolio structures (the arrangement of and relationship between the embedded elements) and the ability of the ePortfolio to support different dimensions of professional practice (Lopez *et al*., 2011; Klein, 2012). Previous research also affirms the challenges, both technical and logistical of implementing ePortfolios into curricula (Andrews & Cole, 2015; Birks *et al*., 2016). However, this has not hindered the development and utilisation of this online tool in health educational contexts.

Maintaining an ePortfolio serves many purposes for different contexts (Figure 1). The current literature suggest there are categories of ePortfolios, namely, those used as a tool for the: (i) collection of evidence; (Karsten, 2012; Birks *et al*., 2016); (ii) a platform to facilitate reflection (Plaza *et al*., 2007; Kostrzewski *et al*., 2008; Tsingos *et al*., 2014; Birks *et al*., 2016); and (iii) a resource to build and strengthen diagnostic practices and processes, track attainment of competency standards and assess clinical competence (Karsten, 2012). ePortfolios from category (i) are used primarily as a representation of the learners' journey, through a systematic collection of digital artefacts (videos, images, audio evidence) and selected documents such as certificates of attainment (for example Senior First Aid; Mental Health First Aid certificates) and managed by the learner as evidence of their accomplishments over time. Category (ii) ePortfolios are used as a platform for reflection to facilitate personal or professional development (Plaza *et al*., 2007; Pink *et al*., 2008; Saltman *et al*., 2012; Green *et al*., 2014, Tsingos *et al*., 2014; Andrews & Cole, 2015)

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and learning (Kostrzewski *et al.*, 2008). Category (iii) ePortfolios are used as an employment ready platform and a tool that could be utilised to evidence competence, experiential placement experiences and achievement for prospective employers (Lopez *et al.*, 2011; Andrews & Cole, 2015, Green *et al.*, 2014).

Figure 1. Utilisation of ePortfolios

Within pharmacy education, Plaza and colleagues reviewed the literature on reflective portfolios (category ii) and described them as a "collection of evidence that through critical reflection on its contents demonstrate achievement as well as personal and professional development" (Plaza *et al.*, 2007: p.1). In addition to personal and professional development, it has been suggested that the utilisation of ePortfolios serves as a tool to encourage pharmacy students to engage with reflective practices (Pink *et al.*, 2008). The use of ePortfolios in this context allows students to assimilate classroom knowledge and aids bridging the gap between theory learned in the classroom and professional practice.

Reflective ePortfolios have also been used in medicine and medical education to assess the theoretical and analytic questioning that occurs after reflection takes place (Saltman *et al.*, 2012). In related research, medical students used a more structured approach to their ePortfolios during their clinical placements. The ePortfolio was developed from the perspective of stakeholders (*e.g.*, students, faculty, and course coordinators) and included templates to guide students through the stages of the reflective learning cycle and personal learning plans. To support the learning process, links to other information, such as a reflective learning tutorial, examples of portfolios, readings, and hyperlinks to health websites were integrated (Pink *et al.*, 2008; Saltman *et al.*, 2012). More recently development of reflective templates have been utilised in pharmacy experiential placements which could be then uploaded to students' ePortfolios to track their experiences on experiential placements (Deslandes *et al.*, 2018). Despite these studies, there is room for further research into the developing structure of an effective ePortfolio in pharmacy education and its impact on student learning for future practice.

The Discipline of Pharmacy in the Graduate School of Health (GSH) at the University of Technology Sydney (UTS), Australia has implemented an ePortfolio to facilitate reflection and provide evidence of student learning in their Master of Pharmacy degree (M.Pharm.). Each cohort of the two-year M.Pharm. degree has approximately 60-65 students. These students are expected to maintain an ePortfolio for the entire degree, to demonstrate that students are able to track and critique their own learning and as a resource to provide evidence of attainment of clinical competencies in applications for employment.

Since 2016, Australia has undergone changes to the National Competency Standards Framework for pharmacists (2016). To reflect these changes, in 2017, the GSH introduced a structured ePortfolio which included sections to facilitate student learning by highlighting areas for students to provide evidence of their attainment of various standards of competence under each of the Five Domains (Appendix A). An exemplar of the interface of the newly structured ePortfolio is found in Appendix B. Prior to 2017, the ePortfolios were not structured to include the Domains and Standards of Competencies. This is the first time ePortfolio usage has been formally evaluated by the School.

This study aims to investigate first-year M.Pharm. students' perceptions of a newly structured ePortfolio in terms of its utility to guide student learning, with a secondary aim to gauge an understanding of whether the new structure supports the students to reflect on their practice while tracking attainment of their clinical competencies.

Methods

The sampling frame for this study was 60 first-year M.Pharm. students (2017) who were enrolled in the Clinical Practice Subject at an Australian university; and were all aged 20 years and over. Before commencing this study, appropriate approval was sought and granted from the UTS's Human Ethics Committee (Ethics no: ETH16-0821). Participants were voluntarily recruited for the study and consent was inferred from those who completed the survey and formal written consent was required for all participants who volunteered to participate in the focus group. The study used a mixed-method approach, adopting a two-phase sequential explanatory design framework (Tashakkori & Teddlie, (2003). The advantages of the two-phase sequential explanatory design methodology allows for Phase 1: quantitative data to be collected first and analysed, to then inform Phase 2: the guided questions for the collection and analysis of the qualitative data. Phase 1 included the administration of a pre-test (pre-use of the ePortfolio) 6-item questionnaire on a 6-point Likert-type scale (Table I), related to student perceptions of the newly developed ePortfolio structure and its utility. The survey was administered to student participants during an

allocated workshop/lab session during Week 1 of a 14-week semester. The pre-test survey was administered prior to students commencing ePortfolio activities and prior to their experiential placements, but after they had participated in a one-hour workshop/lab conducted by the Educational Designer (JW) to explain the new structure and provide students with the opportunity to practice using the new ePortfolio design. During the workshop students were shown that they had the flexibility to utilise any aspect of their ePortfolio and add anything they perceived as essential to their professional development. For example, many students linked their *curriculum vitae* (CV) and a biography (Bio) to their landing page of the ePortfolio (Appendix B). Students were shown how to submit their placement activities and preceptor/supervisor evaluations to the ePortfolio, and how to link their experiential placement reflections to the relevant standard of competence under its respective Domain. Completion of this exercise was required on a weekly basis. In the re-designed ePortfolio structure the Domains of Competency appeared on the landing page, and students could click on these to link evidence (for example: reflections, counselling videos) directly to the respective competency standards.

The pre-test (pre-use of the ePortfolio) survey was provided to the students in the present tense to investigate their perceptions of their future use of the ePortfolio. This was then followed fourteen weeks later (end of semester) with the administration of a post-test (post-use of the ePortfolio) questionnaire utilising the same questions provided in the past tense (Table I). Quantitative analysis (paired t-tests) was conducted using SPSS Version 24 (IBMCorp, Released 2017). The significance level was set at $p < 0.05$.

Table I: Pharmacy students' perceptions of ePortfolios in pharmacy education

Instructions: Circle the appropriate number that indicates to what extent to which you agree with the following statements
Maintaining an ePortfolio: 1. Assists me with understanding of my course material   2. Assists me with the development of my reflective learning skills as it helps me reflect on my clinical placement experiences   3. Takes up too much of my time   4. Enhances my self-directed learning skills   5. Doesn't seem relevant to professional practice   6. Makes me feel more professional
Key: 1 strongly disagree; 2 disagree; 3 mildly disagree; 4 mildly agree; 5 agree; 6 strongly agree

Phase 2 of the study involved a 45-minute student focus group session. Twelve students (males n=5, females n=7) for the focus group were recruited *via* an email distributed to the entire cohort by a clerical staff member, requiring a response to participate in the focus group. The number of participants for the focus group was capped at 12 students (*i.e.* the first 12 students to respond to the email were included in the focus group). The focus group was conducted by an external experienced facilitator and researcher (LS), not associated with the GSH or its student participants. The focus group facilitator utilised guided open-ended questions (Table II) along with minimal encouragers during the session e.g., "go on…"; "I see..," which was audio taped. De-identified *verbatim* transcription was conducted by an external specialist transcription company. Thematic analyses were undertaken by a researcher external to the school (LS) for emergent themes. Data were checked by two additional researchers for accuracy (JW and CL).

Table II: Focus group guided questions

1. When you think of ePortfolios, What comes to mind?   2. What did you feel was the general consensus regarding maintaining an ePortfolio?   3. What are good things, bad things about ePortfolios?   4. Why do you think we have ePortfolios in the pharmacy school?   5. To what extent do you feel that e-portfolios worked well ? if so why? Why not?   6. To what extent did the ePortfolio structure help you become aware of the standards and competencies required for practicing pharmacists?   7. Did you feel there were limitations to maintaining an ePortfolio?   8. In your opinion, how do you think you could improve the ePortfolio? Alternatives to maintaining an e-portfolio?   9. How can use of an ePortfolio as an educational tool be strengthened?   10. What are your thoughts regarding the structure of the ePortfolio with respect to providing evidence for attainment of professional competencies?

Results

(i) Quantitative Data

From a cohort of 60 students, 49 students completed the pretest (pre-sue) and post-test (post-use) surveys (Response rate 82%). As matched data required

pseudonym names, some students did not complete the surveys, or provided names that could not be read or matched, leaving 35 completed matched surveys to analyse (58% of the cohort).

Data were collected and paired according to the pseudonyms provided, and paired t-tests were conducted to show the difference between student views prior to utilising (pre-use) the ePortfolios and 14 weeks after (post-use). There was a significant difference in agreement between the pre-use and post-use student survey questions. Students initially perceived the ePortfolios as a resource that assisted them with the understanding of their course material, (pre-use mean=4.6; SD=0.7) This view changed by the end of the semester (post-use mean=3.6; SD=1.2; $t(34)$=4.4, p<0.05). Students initially perceived the ePorftolios as a tool to assist with their development of their reflective skills (pre-use mean=5.1; SD=0.8) but there was a decline in this item post-use (post-use mean=4.4; SD=1.2; $t(34)$=2.5; p<0.02).

On pre-use, students did not believe that ePortfolios would take up too much time (pre-use mean=3.1; SD=0.9), however by the end of semester students felt that utilising the ePortfolios did take up more time than they had expected (post-use mean=4.2; SD=1.1; $t(34)$=-5.0; p<0.05).

A decline was seen in how students initially perceived the ePortfolios as a tool to enhance them to become more expressive (pre-use mean=4.4; SD=0.9; post-use mean=3.9; SD=1.2; $t(34)$=2.3; p<0.03). Students initially perceived the ePortfolio as an educational tool to enhance their self-directed learning skills (pre-use mean=4.9; SD=0.9). However this view also declined by the end of semester (post-use mean=4.2; SD=1.1; $t(34)$=3.0; p<0.05).

Students initially disagreed with the comment that the ePortfolio did not seem relevant to professional practice (pre-use mean=2.4; SD=1.2). However, by the end of semester, post-use scores decreased on this item (post-use mean=3.4; SD=1.06; $t(34)$=-3.8; p<0.01). Finally, students initially perceived the ePortfolios as a tool that when utilised, makes them feel more professional (pre-use mean=4.7; SD=0.7). However over time, the majority of students believed that the current structure did not support this as much as they had expected (post-use mean=3.7; SD=1.3; $t(34)$=4.9; p<0.05).

(ii) Qualitative Data

Overall it appears that focus group participants viewed the process of reflection as a valuable activity and were in favour of an ePortfolio, but found the structural and software characteristics of the ePortfolio to be detrimental to their experience of the task. Analysis of the transcription of the group discussion revealed three main themes of discussion: (i) purpose; (ii) advantages and disadvantages; and (iii) improvements (Appendix C).

Purpose

Within the purpose category, three themes emerged. Firstly, the ePortfolio was viewed as a record of students' learning. It provides evidence of learning, acts as a resource, and as a career/employment portfolio. Secondly, the purpose of the ePortfolio was seen as educational, enabling students to meet competency standards and develop skills. Thirdly, the ePortfolio was viewed as a tool for reflection. A rich vein of discussion ensued between the focus group participants. They expressed that completing the ePortfolio facilitated a development in their thinking over time. It emerged that the ePortfolio helped the process of reflection, even for those students who didn't enjoy the process. Different ways of reflecting which suit some students and not others emerged, such as talking and participating in peer group, as well as writing. Some focus group participants commented that writing helps them to think things through better than talking. Other participants commented that writing about themselves in a 'positive' manner could be misconstrued as appearing 'boastful' about themselves, and they were concerned about this to the extent that they avoided writing in that way.

The reflection activity was approached by some students not as a task in response to a need for their own personal development, but instead in response to an external pressure, for example, to meet the instructors' expectations, and for grades (marks). In the latter case students would write what they thought the marker wanted to see. They did not reflect on what they had written, but instead focused on what is needed for a high mark. Nevertheless, some focus group participants commented that even though there are marks attached and they often write according to the marking rubric, they still found the task valuable; they believe they think more about their practice having done the task than if they hadn't. The marking rubric was also found to be helpful because it provided structure and direction on how to write reflectively.

Advantages and Disadvantages

Within the advantages and disadvantages category, the perceived advantages were in relation to the educational value of the ePortfolio, such as being good for learning how to think reflectively, and being aligned to their pharmacy degree. The majority of the discussion related to the perceived disadvantages, and these were overwhelmingly related to the practical/user-oriented aspects of the portfolio. Students spoke of the ePortfolio as being too time consuming and stressful for uploading materials regularly and in a timely fashion. There was also strong agreement around what they perceived as needed improvements to the layout. The poor software capabilities were highlighted, such as no notifications or prompts and its inability to link to other software/ documents. Important for the participants was the inability to take the ePortfolio with them after graduation in its current format, and the lack of user-friendliness discouraged potential employers to look at the ePortfolio

because it takes too long to download. Despite these issues, students could see the value of maintaining an ePortfolio and perceive that this tool would be beneficial for the future if software improvements are made. From an educational perspective, students spoke of how due to these disadvantages they felt dis-incentivised to spent time on the portfolio activities, they felt disengaged and lacking in motivation.

Improvements

The final category that emerged from the analysis concerned suggestions for improvement of the ePortfolio. A number of suggestions related to improving the educational experience, such as making completing the portfolio enjoyable and engaging which may include a peer feedback component.

The bulk of the other comments focused on the software/user-oriented aspects. These included using an alternative learning management system such as WordPress would enable the designer to enhance the structure, layout and usability of the ePortfolio. Adding external links, having a common URL to improve editing capabilities, and being able to view the portfolio without having to download it were also recommended. Importantly, personalising the portfolio would make it not only more attractive to students and engage them more, but would also be more attractive to potential employers (Appendix C).

Discussion

This is the first Australian study in pharmacy education to investigate pharmacy students' perceptions of the impact of ePortfolios and its utility to track students' clinical competencies using an ePortfolio structure linking them directly with their reflective statements. Previous research indicates a need for students to evidence a capacity for self-directed learning and to demonstrate attainment of clinical competence (Garrett *et al.*, 2013; Green *et al.*, 2014).

This study reported a significant difference between the pre-use and post-use scores indicating initially that majority of students thought that maintaining an ePortfolio would lead to many benefits such as: developing their reflective skills, assisting them with self-directed learning, enhancing them to become more expressive with their writing and creativity, and making them feel more professional. However over time the majority of students believed that the current structure did not fully support this. Furthermore, students reported frustration with extended time wastage in relation to uploading and/or downloading digital evidence to the ePortfolio, which may have contributed to the negative post-use scores. This finding aligns with previous research in studies conducted on nursing, midwifery and health science students, where many of the students reported dissatisfaction with using ePortfolios due to the technical challenges (Andrews & Cole, 2015; Birks *et al.*, 2016). Despite this, students were acutely aware of

the need to evidence that they are 'satisfying' competency standards and the current ePortfolio structure (linking their reflective statements, and artefacts to clinical competency attainment) as a tool has the potential to be utilised for this purpose.

The qualitative data revealed three key discussion areas related to the ePortfolio utility and structure: (i) purpose for student learning, tracking evidence and developing reflective capacity; (ii) advantages and disadvantages; and (iii) improvements to the current platform.

Previous research indicates that developing reflective capacity of students and future pharmacists is an important component in critiquing one's practice and for future learning (Lonie, 2010; Tsingos, 2013; Tsingos *et al.*, 2014; Tsingos *et al.*, 2015; Lucas, 2016; Tsingos-Lucas *et al.*, 2016a; Tsingos-Lucas *et al.*, 2016b; Lucas *et al.*, 2017; Tsingos-Lucas *et al.*, 2017). The ePortfolio has the potential to support learning and reflection (Saltman *et al.*, 2012). Although the majority of students from this study reported that the reflective rubric embedded into of the ePortfolio guided their reflections, provided a structure and direction for building on reflective capacity and learning how to improve future practice and/or tasks, post-use scores related to enhancing learning and reflective skills were not as positive. The focus group results did indicate that initially some students felt unmotivated in using the ePortfolio and they wrote reflections to appease the assessor rather than for the purpose of self-reflection. However, over time majority of students could see '*where this process was going*' and how they could benefit by documenting their learning through their written reflections in their ePortfolios as it '*teaches you a lot*', and '*make you step back and think about what kind of attributes you have as a pharmacist and where you can improve*'.

The qualitative data has provided some possible insights into the drop from pre-use to post-use scores which may be related to: (i) both instructor and student unrealistic expectations prior to the ePortfolio use; (ii) students not understanding the pedagogy related to the importance of self-reflection; and (iii) a misconception on the part of the student as the major purpose and goals for maintaining the ePortfolio as a tool to enhance self-reflection and track clinical competencies over time. The students from this study participated in a one-hour workshop/lab to enable them to become more familiar with the ePortfolio processes, structure and design. It appears that more training and communication regarding purposes and relevance is perhaps required for future cohorts. Providing exemplars, and relating them to student learning outcomes and relevance to future learning and employment ready processes may assist.

Students initially perceived the ePortfolio as a "*great concept*" as a tool making them feel more professional, with the idea that the product could be used to highlight their achievements over time to prospective employers. However, the software in its current form has limitations for students to share their ePortfolio to public forums such as Linkedin, and time consuming to upload and download digital evidence as it requires too many external links to showcase the material.

Creativity and individualism was a finding from this study that students perceived as important when maintaining an ePortfolio and developing an employment ready product which could enhance them to become more expressive. Aesthetics of the ePortfolio was a key discussion point as students acknowledged that the current template ("*just so bland*"; "*not much appeal*" and "*not engaging enough*") would not enable students to be creative and individualise their ePortfolios. Personalising their ePortfolio and making it more attractive to engage with was perceived to have potential to make their product "*stand out*" to showcase future prospective employers.

A limitation of the study was that it involved only one pharmacy school at one institution. One of the limitations related to the time allocated for students to be 'trained' in the use of the ePortfolio. Only a one-hour workshop was allocated into the curriculum and perhaps further training for students is required. Recruitment for the student focus group session was capped at twelve participants who were the first to respond to the email. The authors recognise that perhaps the more proactive students or students who wanted to express either a positive or negative aspect of their utilisation of the ePortfolios may have introduced bias to the study. Therefore, a random sample of twelve students from all that responded may have reduced any potential biases, hence indicating a limitation of the study. However, students did not receive any incentive to participate in the study and both negative and positive comments were generated as a result of the study. The mixed-methods design allowed for quantitative and qualitative data collection, with the entire cohort having the opportunity to identify their perceptions of the use of the ePortfolios in the quantitative Phase 1 of the study, which was a strength of the study. Future directions for further research in this area include students' perceptions related to how they spend their time utilising the elements of the ePortfolio and follow-up studies related to graduates who continue to use their ePortfolios for career development.

Overall, the results of this study indicate that student perceptions of the current ePortfolio platform has the potential to be improved to engage students in their self-directed learning, tracking competency standards over time, and linking it with a reflective process. With technical improvements (software design) and practicality of structure and aesthetics to enhance engagement, students perceived that this educational tool has the potential to support their learning and reflective processes.

Pharmacy students perceived the ePortfolio needed improvements to reach its full potential. Students indicated that maintaining an ePortfolio to track professional competencies, linking digital evidence and reflections is useful in the M.Pharm. degree. Considerations for its purpose, structure and template, improving software design capabilities and allowing for creativity to individualise and personalise this platform was reported by pharmacy students as essential to the improvement of such an educational resource. Future studies collaborating with other universities to follow up on this work on a much larger scale would be beneficial.

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Appendices

Appendix A: Domains and Standards of Comeptence for the ePortfolio[a]

Portfolio: Domains and Standards of Competence	
Domain 1: Professionalism and Ethics	Standard 1: Upload professionalism in practice Standard 2: Observe and promote ethical standards Standard 3: Practise with appropriate legal framework Standard 4: Maintain and extend professional competence Standard 5: Apply expertise in professional practice Standard 6: Contribute to continuous improvement in quality and safety
Domain 2: Communication and Collaboration	Standard 1: Build partnerships for the delivery of patient-centred care Standard 2: Collaborate with professional colleagues Standard 3: Communicate effectively Standard 4: Apply interpersonal communication skills to address problems
Domain 3: Medicines Management and Patient Care	Standard 1: Develop a patient-centred approach to medicine management Standard 2: Implement the medication management strategy or plan Standard 3: Monitor and evaluate medication management Standard 4: Compound medicines Standard 5: Support quality use of medicines Standard 6: Promote health and well-being
Domain 4: Leadership and Management	Standard 1: Show leadership of self Standard 2: Manage professional contribution Standard 3: Show leadership in practice Standard 4: Participate in organisational planning and review Standard 5: Plan and manage physical and financial resources Standard 6: Plan, manage and build human resource capability Standard 7: Participate in organisational management
Domain 5: Education and Research	Standard 1: Deliver education and training Standard 2: Research, synthesise and integrate evidence into practice Standard 3: Participate in research
[a] National Competency Standards Framework for Pharmacists in Australia (2016)	

Appendix B: Student's ePortfolio exemplar landing page ª

ª *Permission to utilise this portfolio for the publication has been granted*

Appendix C: Emergent themes identified from the student focus group with example direct student quotes

Theme	Theme Outcomes	Example Quote(s)
ePortfolio Purpose	A resource as a Career portfolio	"Things we could hopefully draw upon when trying to find jobs, so experiences we can draw upon as evidence of what we're capable of." (Female)
		"Also using it as a reference for interviews and such." (Male)
		"Yeah it compiles all your relevant documentation." (Female)
	An educational tool to track competency standards	"It's for us to be able to answer to the graduate attributes and for us to reflect on our experience." (Female)
		"…and for when we go to become registered [licensed], it's so that we can say, hey I have evidence of satisfying this competency, I can tell you about this time, what happened, how it happened and how I demonstrated that attribute." (Female)
	A valuable tool to facilitate reflection	"But I think in the future when you go back and read – say you wanted just to extract some bits for your resume, you'll realise, okay actually I started here and if I read my reflections 10 weeks later there's a significant change in certain areas." (Male).
		".. So if I've done an activity one week and then a patient comes up to me a week after when I'm at placement and they ask me something in regards to that activity, then I find that I'm much more knowledgeable as a result of doing that activity. Just the situations and experiences that you come across, you just grow from it and just develop really." (Male).
		"I think rather than talking about – sorry, writing about it [reflecting on practice], I'm keener to talk about it, and I tend to do that with the group of friends." (Female)
		"Yeah I'm a fan of having to write it down rather than talk it out, because when I talk it out I might say things that are a bit spontaneous and unstructured, just coming out of my head." (Male).
		"When it comes to writing I feel like, okay now I sound a bit cocky here. I can tell you all the negatives, but when it comes to the positives I just can't put it on paper and say, here. Especially if it's to my teacher or something. Maybe there's an art to it …" (Male)
		"It is, I mean we might be a bit dragged into it kicking and screaming but once you actually do, do it, it does teach you a lot. … Then the self-reflection, it does sort of make you step back and think about what kind of attributes you have as a pharmacist and where you can improve." (Female)

Theme	Theme Outcomes	Example Quote(s)
Advantages and Disadvantages	Advantages of maintaining an ePortfolio	".. obviously the ePortfolio has those advantages because it's more structured to our degree, which is great." (Female) " feel from personal experience, that I've learnt a lot from the activities [linking self-reflection with working towards attaining competency standards]." (Female) "For me, the concept was great, I love it, I don't think the concept needs any more work, it's there for a purpose and it will serve its purpose, for us in the future. It's just, yeah for me it's just the software." (Female)
	Disadvantages of maintaining an ePortfolio	"It's just too time consuming, there's no point. No one is going to be bothered." (Male) Lots of people actually said if I were an employer for example and I have to download every document, I just won't. I don't want to download anything on my computer I just want to see it." (Male) "You can download it and just take a copy." (Male) "but then can't edit it in the future." (Female) "Too many external links now, to get somewhere you have to go through a few other hoops to get to … Blackboard itself it's not the most user-friendly thing to use .. the major thing for me is, when I want to upload a word document I want it to come up – when someone goes on there they can view it instead of downloading it. That's a major thing. If they're telling us that employers don't look at your resume for more than six seconds .." (Male)
	Disagreement with grading aspects of the ePortfolio	"I don't reflect on the page, I reflect in terms of the mark." (Female) "They are going to mark me according to this rubric, so when I'm going to reflect at the end it's going to be biased by this rubric." (Male)
	Limitations to the aesthetics of the ePortfolio	"Right now ePortfolio is just so bland." (Female) " Exactly and I wouldn't actually want to share it. Right now, the way it is, I'm like what's the point?" (Female) "For me it's – look I could make time for it, obviously we all can, but it's just - it's not engaging enough for me to do so." (Male)
Suggestions for Improvement	Improvement for Feedback mechanism	".. the possibility of someone else that is checking your portfolio, making that comment private for you to improve it .. maybe you want to think about feedback about the portfolio itself." (Male) "Maybe even peer feedback?" (Female)
	Improving the aesthetics to make it more personalised	"there's not much appeal to be had with black writing on a white background." (Female) "it'll allow better expression of self as well, not just that, you'll spend more time on it." (Male) "Yeah because you enjoy being on there, like you know what, this actually represents me." (Male)
	Improvement in software/user-oriented aspects	"Make it so everything can be done in the single – on the one place. So writing down things, submitting things, editing, using the – that feedback tool …" (Male) "It needs to be a standalone product if we want to keep it forever." (Male) "Yep, it's [Wordpress] just like a word processor, it's like your own URL kind of blogging space, and you can upload that to your LinkedIn, Facebook, anywhere, pretty much wherever you want, you just copy and paste the URL and you have access to it." (Female)