The Transformative Role of ePortfolios: Feedback in Healthcare Learning

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This article reports findings of a study based in Scotland that explored healthcare learners' experiences of feedback and ePortfolios. Feedback is a highly complex, multi-dimensional phenomenon, and healthcare learners consider it essential for their learning, recognizing that without it patient safety may be compromised. This study sought to explore whether ePortfolios, with their dual emphasis on both the product and process of learning, could encourage deeper and broader learner engagement with feedback. Drawing upon three examples where ePortfolios have been embedded into the curriculum, our findings demonstrate that most participants were generally positive about using the ePortfolio to access, read, and store feedback on their assessments. In some cases where ePortfolio had been introduced across a program, a number of learners had also begun to use feedback provided through the ePortfolio as a springboard for reflection and planning for future development. However, many of our students missed the wider opportunities for long-term, regular creation of and engagement with feedback through the ePortfolio. After reviewing our implementation and using novel work based on threshold concepts, we propose the Personal, Learning and Thinking Skills (PLTS) framework as a guide to support deeper learner engagement with feedback.

Introduction

The aim of this article is to contribute to current debate and inform practice on how and in what ways an ePortfolio can be used to encourage learner engagement with feedback. We drawn upon research, funded by the United Kingdom's (UK) Higher Education Academy Subject Centre for Health Sciences and Practice, into learner experiences of feedback and ePortfolios at a new university in Scotland. First, we set the context of our study and demonstrate the significance of feedback with particular reference to learners in healthcare education. The ePortfolio is introduced as a tool to support both the product of learning as well as the process of learning. It is anticipated that this dual role will support more extensive engagement with feedback leading to deep learning. Next we outline the study design before giving three very different examples to illustrate where ePortfolios have been used to stimulate learner engagement with feedback within healthcare learning at the module and program level. Our findings regarding learner experiences of feedback and ePortfolios are then presented. Finally, after reviewing our implementation and using novel work based on threshold concepts, we propose the Personal, Learning and Thinking Skills (PLTS) framework as a guide to support deeper learner engagement with feedback.

In this study, we denote healthcare education to encompass learners in regulated professions such as nursing, medicine and the allied health professions whose primary goal is learner acquisition of clinical competence to ensure patient safety (General Medical Council, 2010; Health Professions Council, 2010; Nursing and Midwifery Council, 2010). Most undergraduate healthcare programs in Scotland consist of four years of full-time study with master's programs requiring two years of full-time study or equivalent. A healthcare program consists of a number of discrete units of study referred to as modules.

The Significance of Feedback

Feedback is a highly complex, multi-dimensional, social phenomenon (Nicol, 2010; Poulos & Mahony, 2008; Sadler, 2010) supporting learning as well as increasing reflective skills and helping students to prepare for their future beyond the academic environment. Students vehemently believe in feedback, perceiving it to be essential for learning and progression (Burke, 2009; Rowe & Wood, 2008). Feedback is particularly significant for healthcare learners: failure to address feedback may impact directly upon the patient and could have severe or even life-threatening consequences (Price, Hopwood, & Pearce, 2000).

Healthcare learners develop cognitive, psychomotor, and affective skills during their studies, as well as the knowledge essential for their professional roles. Consequently, feedback provided to such learners will be highly complex but will always include an appraisal of current performance and an evaluation of competence. It is essential that students be prepared to receive such feedback, that they reflect upon it, and that they reconcile it with their theoretical learning (Croxon & Maginnis, 2009). However, feedback experiences for healthcare learners frequently occur in the clinical setting, and are thus more informal and less predictable than those in the traditional academic setting. Seminars and tutorials are relatively easy for the student and tutor to use for discourse about progress, planning, and signposting for self-appraisal, but in the busy clinical
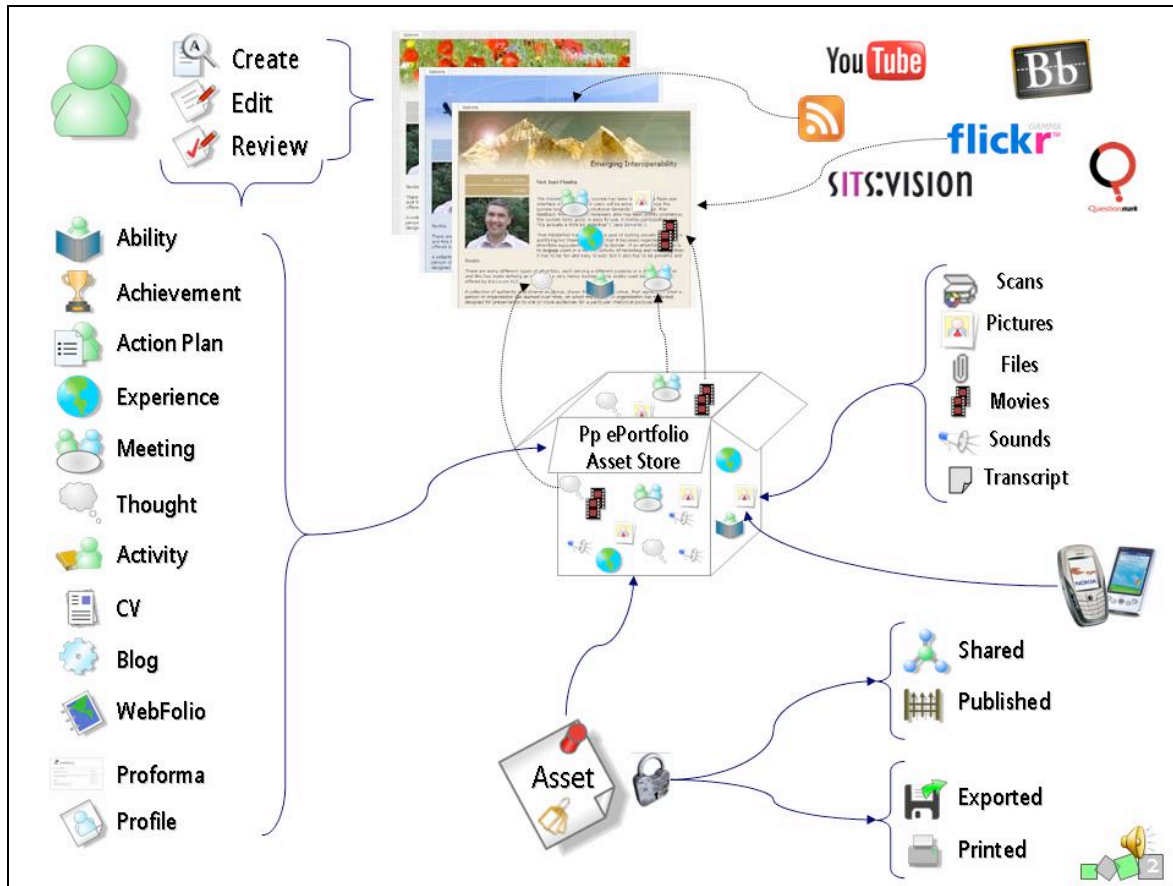
Figure 1
The PebblePad ePortfolio

Figure 1. (© 2008, Pebble Learning Ltd. Used with permission.).

environment, patient workflow and service demands are prioritized, hence planned feedback sessions may be extremely limited and haphazard (Eraut, 2006; Wood, 2000).

Despite concern that learners neither collect nor respond to feedback (Wojtas, 1998), studies demonstrate consistently that learners collect feedback even if engagement is rather limited, such as checking through comments and content, skimming, "bearing in mind" comments for future work rather than being reflective and focusing on the development of meta-cognitive lifelong learning skills (Orsmond, Merry, & Reiling, 2005). Thus, our study stemmed from a need, in our role as educators, to support healthcare learners to engage more deeply with formative and summative feedback.

ePortfolios and Learning

In common with many institutions in the UK, ePortfolios have become integral to the learning landscape at Queen Margaret University (QMU), being

used in most healthcare subjects such as physiotherapy, nursing, and radiography. ePortfolio systems may vary across institutions, but within the technology a range of tools are normally available to the learner including blogs, online folios, online CVs, and online proformas (see Figure 1). The ePortfolio system used by students and faculty at QMU is PebblePad, a generic personal learning system initially developed by eLearning experts at the University of Wolverhampton. The range and flexibility of the tools within an ePortfolio can be implemented, for example, to support learning and teaching, encourage personal development planning, increase retention, and improve employability. Numerous examples are now available demonstrating the advantages of implementing an ePortfolio in many different scenarios (JISC, 2011; Strivens, Baume, Owen, Grant, Ward & Nicol, 2008).

Learners are often required to use an ePortfolio as part of their assessed academic work. In this case the tools used within an ePortfolio provide a digital repository evidencing learning. The ePortfolio in such examples is therefore: "...a purposeful aggregation of

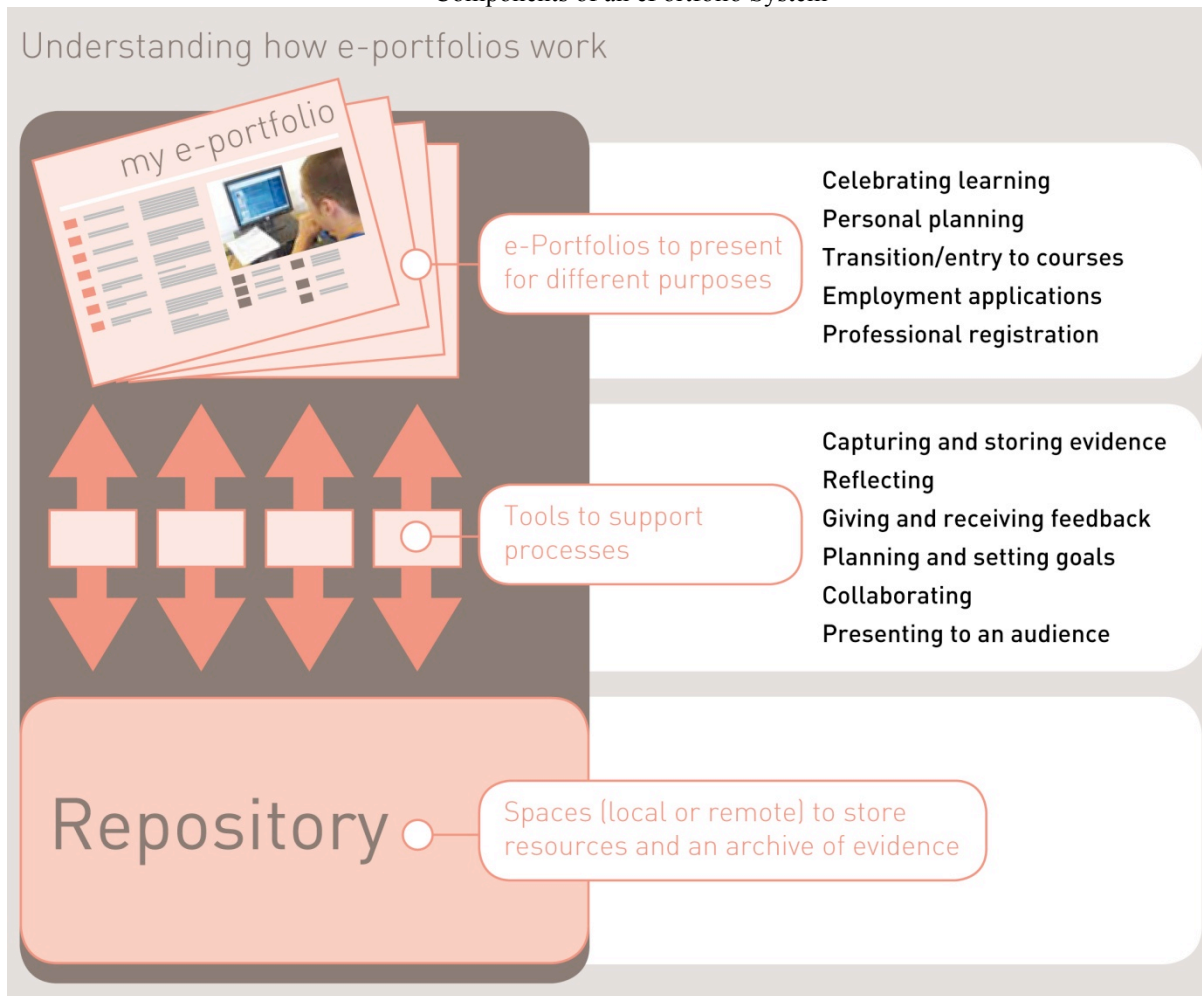Figure 2
Components of an ePortfolio System

Figure 2. (© 2008, JISC infoNet. Used with permission.)

digital items - ideas, evidence, reflections, feedback etc. which 'presents' a selected audience with evidence of a person's learning and/or ability" (Sutherland & Powell 2007).

ePortfolios may also support the *processes* of learning including planning, sharing, and reflecting as well as the development of key meta-cognitive skills such as time management, group work, and critical awareness (JISC, 2008). Again, examples in a variety of subject areas are available (Centre for Recording Achievement, 2011). For healthcare education, the ePortfolio has much potential; for example, students may share reflections created in a blog in the ePortfolio on learning from placements with clinical educators, which leads to dialogue and then further reflection on current theoretical knowledge through the ePortfolio. The tool then supports learners to plan for future learning activities, which can test their emerging knowledge and skills. This dual purpose of the ePortfolio

(product and process) is captured diagrammatically in Figure 2.

ePortfolios and Feedback

The flexibility of the tools within the ePortfolio system and the dual foci of product and process have the potential to support deeper and more long-term engagement with feedback for healthcare learners. Primarily, the wide range of tools within an ePortfolio provide mechanisms for our learners in creating, capturing, collating, and reflecting on feedback from a variety of learning experiences and a number of sources: peers, clinical educators, tutors, and self (process of learning). All types of feedback (visual, textual, and audio) may be held within the ePortfolio, collated, and then returned to by learners as and when required and used as a basis for reflection on competence and professional development. The opportunities for sharing could also support on-going

Table 1
Focus Group Participants

Focus Group	Number of Participants	Age Range	Program	Year	ePortfolio Tool(s) Used	Type of Feedback
Pilot	3 [all female]	18-19 [mean = 18.3]	BSc Diagnostic Radiography	1	Blog; Webfolio with Proformas for clinical activity	Formative
1	5 [4 female; 1 male]	22 – 39 [mean = 30.8]	BSc Diagnostic Radiography	4	Blog; Webfolio with Proformas for clinical activity	Formative/ Summative
2	3 [all male]	40 – 44 [mean = 42.6]	BSc Diagnostic Radiography	2	Blog; Webfolio with Proformas for clinical activity	Formative
3	4 [3 female; 1 male]	26 – 32 [mean = 28.7]	BSc Diagnostic Radiography	3	Blog; Webfolio with Proformas for clinical activity	Formative & summative
4	7 [4 female; 3 male]	26 – 37 [mean = 30.3]	MSc Pre-reg Physiotherapy	2	Webfolio	Formative
5	6 [all female]	22 – 29 [mean = 23.8]	BSc Nursing	4	Webfolio	Summative
6	6 [all female]	21 – 24 [mean = 22.5]	BSc Nursing	4	Webfolio	Summative

dialogue with peers and supervisors (academic and placement) from wherever the learners may be physically located.

Secondly, ePortfolios may be used for the submission of assessments (product of learning) that draw upon evidence of the process of learning. The ePortfolio provides an ideal medium to return feedback to learners on the product of their learning. Such feedback could then be used for further learner reflection and dialogue. This should ultimately help our learners to reflect on their current learning, their achievements, and their competencies; and it should also serve to assist learners in planning for future learning opportunities that will help develop cognitive, psychosocial, and affective skills in preparation for their professional lives.

Building upon four years' experience of implementation of and research into ePortfolios at QMU (Peacock & Gordon, 2007; Peacock, Gordon, Murray, Morss, & Dunlop, 2009), we sought to establish a clear picture of how our learners actually engaged with feedback through ePortfolios and explore whether both roles of the ePortfolio (product and process) are utilized. This article provides an overview of the study's findings; full details are reported elsewhere (Peacock, Murray, & Scott, 2011).

Study Design and Methodology

This was a qualitative study: qualitative research is recognized as having the strength of generating rich data (Glazier, 1992) and involving an interpretive process (Mason, 1996). Employing a collective case study design, we were able to study, in-depth, three examples of where an ePortfolio had been integrated into healthcare education, at either module level (case study 1), or program level (case studies 2 and 3). Each case was selected purposefully on the basis of relevance to the focus of our study and enabled us to identify cohorts of healthcare learners who were using ePortfolio for assessment and feedback and who would encounter similar experiences of using this relatively new practice (Kitzinger 1995; Mays & Pope 1995). Ethical approval was obtained from the institution.

Methods of data collection included questionnaires and focus group activities. Tutors provided background information regarding the use of ePortfolios for feedback and assessment in each of the three case study areas via self-completion questionnaires. Data were gathered from learners regarding their preferences and experiences of feedback in general, as well as feedback with an ePortfolio, via six subject specific focus groups (Kitzinger, 1995). Participation in focus group sessions

Table 2
Use of ePortfolio in Case Study 1 - Nursing

Cohort and method of study	Module duration and assessment format	ePortfolio usage	ePortfolio induction approach	Support
n=35 female n=34 male n=1 Full-time	5 months (September – January) 4 hours per week - including facilitation and master classes. 1 summative assessment based on webfolio. 30 credits.	Using the webfolio tool, students develop an online portfolio which contains a critical commentary of their learning, linked to evidence of teaching/ facilitation, group dynamics and practice development which has been carried out throughout the module.	The concept of an online portfolio is introduced on day 1 of the module as an alternative means of assessing the students' learning on the module. ePortfolio induction took place on day 3 of module via a 2 hour, hands-on workshop session.	Pedagogical support provided through the facilitated learning taking place in the module – it is a problem based learning module where students identify knowledge gaps and then research to fill the gaps. On-going ePortfolio support was offered by the specialist group in the Centre for Academic Practice. A second optional support session prior to submission for assessment was also available. Documentation was provided about the content and structure of the webfolio. It was felt that no additional support was required other than this.

Table 3
Feedback Provision in Case Study 1 - Nursing

Type of Feedback	Feedback Provider	Feedback Location	Difference to Paper-Based Feedback	Advantages of Using ePortfolio for Feedback
Feedback on summative assessment	Two members of the teaching team External examiner	Individual comments in sections of webfolio Uploaded pro-forma on specified section of webfolio	No significant difference to feedback on paper-based portfolio	It was hoped that the students would look at feedback in relation to each section of the webfolio and that this would make it easier to contextualise feedback.

Table 4
Use of ePortfolio in Case Study 2 - Physiotherapy

Cohort and method of study	Course duration and assessment format	ePortfolio usage	ePortfolio induction approach	Support
Level 1: n=23 females n=17 males n= 6 Level 2: n=26 females n=17 males n=9 Full and part-time	2 years 1 summative assessment incorporating four formative assessments Credit weighted	Learners were encouraged to use the following tools within the system: • Webfolio • Thoughts • Experiences • Forms • Blogs	The idea of the ePortfolio and its role in professional and personal development was introduced to Level 1 within the first few weeks of semester. Tutors provided exemplars of webfolios and links to the assessment. A hands-on induction workshop was provided by the Centre for Academic Practice (CAP).	Lectures on reflection, PDP and development of portfolios were provided as well as optional weekly drop-in sessions available for students with queries on using ePortfolio. Additional ePortfolio support was available through specialist group in CAP. Extensive documentation was provided about the purpose of the ePortfolio, the formative tasks and the final assessment.

was invited from the three healthcare subject area cohorts: Nursing (n=35); Physiotherapy (n=49); and Diagnostic Radiography (n=72). Three students were recruited from the level 1 Diagnostic Radiography cohort (n=36) to participate in the pilot focus group; these students were female. An invitation to participate in subject specific focus group sessions was extended to all students within the specified levels of the three healthcare subject areas. Recruitment was initially carried out in person by a member of the project team; further recruitment was initiated via targeted email invitations and also through the cooperation of subject tutors. The total number of students who actually participated was 31 (female n=23, male n=8): approximately 20% of the overall sample.

An inductive and interpretive analysis process was employed. Data were interrogated iteratively by the project team, enabling both the value as well as any shortcomings of ePortfolios for feedback to be identified, and recognizing that a range of learner experiences was possible. As researchers we were interpreting experiences from the point of view of the individuals involved and, therefore, constructing knowledge. Basic demographic data and program details for each group are outlined in Table 1.

Case Studies in Healthcare Education

It was anticipated that in our case studies learners would use the ePortfolio to develop a more informed sense of their cognitive, psychomotor, and affective skills and achievements through deeper and more extensive engagement with feedback. Learners were all introduced to the ePortfolio as an assessment tool (product of learning) and to support the processes of learning; the three assessments all required evidence of the processes of learning. In all three of the case studies there was a hope, often articulated by tutors, that some students would use the ePortfolio to generate self-feedback as well as collecting, storing, collating, and reflecting on feedback provided by peers, clinical educators, and tutors across their program of study and that this would lead to deep learning. In the latter two case studies there was a strong emphasis upon comprehensive utilization of the ePortfolio throughout the program of studies, as well as its role in continuing professional development (CPD) after graduation and into employment in the healthcare professions. Learners at QMU have access to the ePortfolio system after graduation and can use the tool to support CPD in their professional roles.

Case study 1: Bsc (Honours) Nursing. The first case study was drawn from the final year of a four-year nursing undergraduate program. Learners undertook the module "Preparation for Clinical Leadership," which is designed to encourage the integration of theory and practice of managing change, leadership, and teaching and learning approaches. Thus, the module prepares final year nurses for their future role in the U.K.'s National Health Service (NHS) in managing change and teaching various levels of staff, students, and patients/clients. Learners submit an online commentary in the form of an online folio for their summative assessment - the *product* of their learning. However, this commentary is linked to a variety of examples that evidence the *process* of their learning throughout the module. Table 2 illustrates ePortfolio usage in this case study.

Summative feedback was supplied by two tutors and took the form of online comments on specific sections of the online folio, and in some cases further feedback was provided via an online proforma. The aim of the feedback was to inform students of their performance in terms of their learning, with emphasis on the linking of their evidence in the portfolio to their learning commentary. The module focused on the process of learning rather than knowledge production so the tutors wanted to see specifically how the students were using and synthesizing their learning. It was hoped that the students would engage more fully with the feedback provided on the online folio since it was linked to specific sections of the online folio and because the module emphasized the importance of using feedback as a springboard for reflection and planning for future learning. Table 3 illustrates feedback provision in this case study.

Case study 2: MSc (pre-registration) Physiotherapy. The second case study focused on learners in both years of an MSc (pre-registration) Physiotherapy program: a two-year program for science graduates who wish to pursue a career as a physiotherapist. Here the ePortfolio was used not only for assessment submission but also to support reflection and personal development planning, linked to professional studies, as advocated in much tutor guidance about ePortfolios (JISC infoNet, 2008; Peacock et al., 2009). Students were required to use an ePortfolio for both Professional Studies and Practice-Based Learning modules with the aim being to support students in developing a reflective approach to learning, both in and out of the practice setting. The ePortfolios in these modules were used as a space where the learners could link all aspects of their learning including feedback in one place. An overview of the module and ePortfolio usage in this case study is presented Table 4.

Table 5 provides an outline of feedback provision through ePortfolio for the physiotherapy learners. In this case, it was specifically and repeatedly articulated to learners to use feedback

Table 5
Feedback Provision in Case Study 2 - Physiotherapy

Type of feedback	Feedback provider	Feedback location	Difference to paper-based feedback	Advantages of using ePortfolio for feedback
Feedback on formative and summative assessments at the end of semesters 2, 3 and 6	Tutors NB: Students were encouraged to share their reflections in the blog tool with their peers for support and formative feedback.	Comments provided on formative assessments. Summative feedback was provided through uploaded pro-forma. The feedback provided through the webfolio is similar to that provided on paper-based portfolio and if appropriate students can request a one to one session with tutors. In the future, it is hoped to extend feedback to include audio feedback.	No significant difference to feedback on paper-based portfolio.	It was hoped that the students would look at feedback in specific sections to focus on areas where they needed to improve. It was easier to provide feedback through the ePortfolio than through central administration at the institution. Tutor independence in setting up and organising the online assignment dropbox.

Table 6
Use of ePortfolio in Case Study 3 - Radiography

Cohort and method of study	Course duration and assessment format	ePortfolio usage	ePortfolio induction approach	Support
Level 1: n=36 Level 2: n=31 Level 3: n=22 Level 4: n=19 Full -time	4 years Levels 2 & 3 – 600 hours: Tutorials 30hrs; Clinical Practice + Reflective Practice + Independent Learning 570hrs. Level 4 – 600 hours: Workshops 10hrs; tutorials 20hrs; Clinical Practice + Reflective Practice + Independent Learning 570hrs. 1 summative ePortfolio assessment per level. Level 2, 3 and 4: 60 credits per module. 'Mark' comes from the staged assessments; ePortfolio is pass or fail, no specific credit awarded.	Webfolio with proformas for clinical activity – learners were provided with template to copy and adapt Blogs In addition, learners were encouraged to explore and use any tools appropriate for personalisation.	*Level 1* The concepts of reflection and PDP were introduced early in Semester 1 to first year students as part of their Professional Practice module although these are specifically not assessed in this module. Lecturer using PowerPoint presentation to discuss these key concepts. A hands-on, workshop introduction was also provided to demonstrate all of the tools of the ePortfolio system to the students (although it was not expected that they would use all of the tools). The aim was to encourage students to explore the ePortfolio system and select the tools that they wished to use and which were most appropriate for their learning style. *Level 2- 4* Students were provided with top-up sessions about ePortfolios, reflection and PDP and then offered drop-in sessions.	In the early stages (level 2 particularly), additional practical technical support was required by some students; this is because there is little time for the students to explore the tool at leisure. This additional support was offered either on a one-to-one basis or in very small (2 or 3) groups by the tutor. Some students also attend workshops run by the CAP to enhance their skills. Support was required to enable students to develop skills of reflection and reflective writing and the concept of evidencing clinical activity. This was provided by the tutor and students were also encouraged to seek the help of the Learning Support department. Extensive documentation was provided about the purpose of the ePortfolio and how to use the system.

Figure 3
Example of an Online Portfolio for a Radiography
Student Together with Feedback Dialogue Between Tutor and Student

Figure 4

Example of Online Folio Where the Radiography Student has Identified Personal
Learning Needs, Learning Outcomes, and an Action Plan for the First Year in Employment
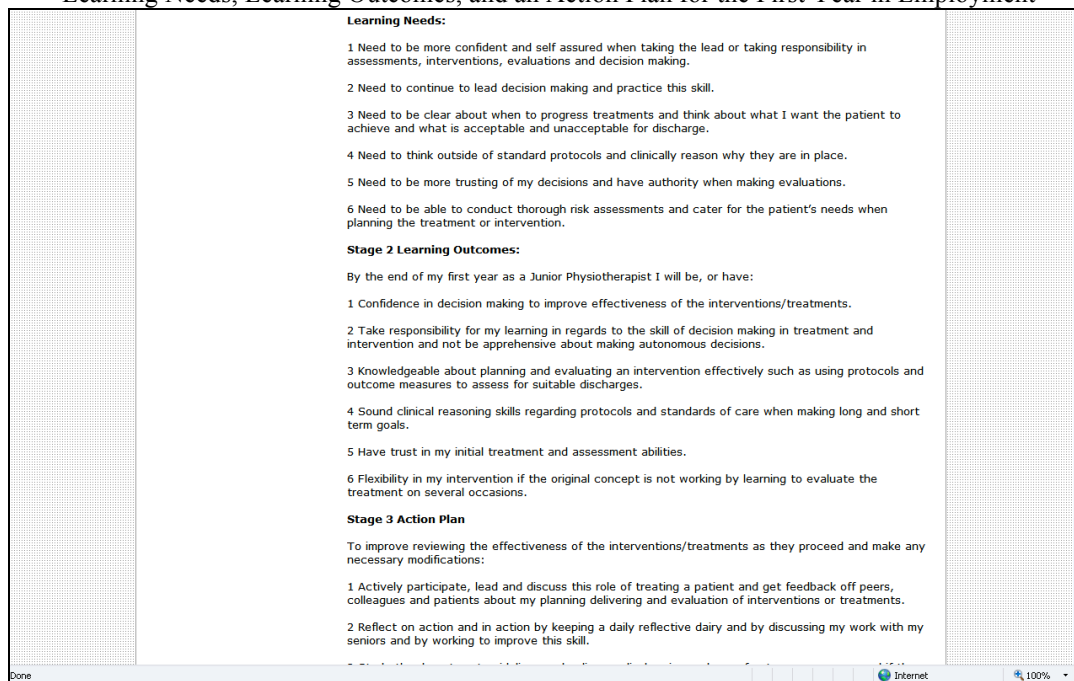
as a springboard for reflection and planning of future learning experiences throughout their program of studies and this would then support them in engaging with CPD throughout their professional lives.

Case study 3: BSc (Honours) Diagnostic Radiography. The third case study focused on learners in the second, third, and fourth year of their studies in an undergraduate program who undertake clinical practice in diagnostic imaging modules for these respective levels. Clinical education placements have a theoretical as well as a practical focus, providing opportunities for students to develop, evaluate, organize, and build upon academic learning in a progressive fashion. Here the ePortfolio was again used not only for assessment submission (product of learning) but also to support reflection and personal development planning linked to professional studies (process of learning). The ePortfolio system was primarily used to develop the skills required for students to reflect upon their learning in the clinical environment and to demonstrate the ability to link theory with practice. Learners can build and maintain a robust record of their clinical activity and their learning by linking additional evidence of learning to their reflective accounts throughout their final three years. Again tutors explained on a regular basis the role of the ePortfolio in collating and reflecting on feedback. Table 6 demonstrates ePortfolio usage in case study

three. Figure 3 illustrates tutor and student dialogue around a blog entry, and Figure 4 provides an example of an online folio where the radiography student is identifying personal learning needs and learning outcomes and has developed an action plan.

Extensive, written formative feedback is provided at least once, and often twice, on draft online folios, using the comment tool in the ePortfolio system as illustrated in Figure 4. Typically, feedback focuses on the quality of the writing, descriptive content, identification of key learning experiences, level of reflection, and degree of evaluation of practice. Additional evidence of learning presented by the student is also scrutinized and comments are provided on its value. Students are asked to acknowledge and respond to the feedback, using the comment tool, and to retain these comments as part of the summative assessment. This creates a record of tutor/learner interactions and allows the tutor to see whether changes and improvements have been made to work when it is next reviewed. It also allows the tutor to identify those students who do not engage with the process and are likely to be unsuccessful and thus need additional support. Table 7 provides a summary of the feedback process through ePortfolio in this case study.

Results

In all three case studies, learners reported significant and in some cases repeated engagement with

Table 7
Feedback Provision in Case Study 3 - Radiography

Type of Feedback	Feedback provider	Feedback location	Difference to paper-based feedback	Advantages of using ePortfolio for feedback
Feedback on formative and summative assessment	All formative and summative feedback provided by a single lecturer. Double marking performed by second lecturer. Feedback printed for the external examiner to scrutinise and ePortfolios made available for the external to review. Learners were shown how to share their webfolios with peers and encouraged to work collaboratively and provide feedback. However, not all learners opted to use this facility, preferring to engage in an internal reflective dialogue. Others liked to share with peers and the comments and feedback provided were recorded on the webfolio and could be viewed during the assessment process	For formative feedback, comments were made on individual assets - for example, on individual thoughts in a blog. For the summative assessments one comment was attached to the 'front page' of whichever tool the student used. However, when uploading to the online assessment drop-box, some students neglected to allow the comment facility on their webfolio so that the tutor could make the comments on the activity log webfolio. A webfolio template was provided for them to copy from a gateway and always carried a comment facility.	It is always easier and quicker to provide feedback to individual students face-to-face; however, the comments in ePortfolio are a permanent record of their progress and can be reviewed repeatedly if required. If a student does not understand the feedback provided or does not know how to make changes, there is an expectation that learners will request a face-to-face meeting. Ultimately the ePortfolio has not changed the way that students respond to feedback.	Providing extensive, personalised feedback (written) on portfolios to students, with face-to-face meetings if required, is essential. The ePortfolio can be reviewed and assessed from anywhere.

Table 8
Form of Engagement with Feedback and Frequency Reported

Focus group cohort	Reading feedback	Reviewing feedback	Questioning feedback
Radiography 2	13	0	0
Radiography 3	6	1	0
Radiography 4	4	0	0
Physiotherapy	10	0	0
Nursing 1	4	3	0
Nursing 2	11	2	5

tutor feedback delivered on the product of their learning through ePortfolios such as skimming, reading, saving, or storing feedback (see Table 8). Some learners, notably the radiography cohort, reported more novel and extensive means of engaging with feedback delivered through ePortfolio, such as responding to feedback using the comment function within the tool, thereby creating a personal, electronic dialogue with their tutor: "I quite like the fact that if there's one specific issue you can generate a dialogue and I would never have done that with a paper-based feedback" (radiography student). There was some limited evidence of learners starting to generate, collect, collate, and reflect on feedback in the ePortfolio and using it as a springboard for the development of meta-cognitive skills and planning of future learning opportunities.

Perceived Benefits of Feedback and ePortfolio

In the focus groups, learners tended to focus on the benefits of receiving feedback through the ePortfolio on their summative assessments (product of learning). They were generally very positive and cited many advantages, including constant availability, ease of access, improved organization and security of materials and personalization of feedback:

- ...to go back and find it if we needed it would be a lot easier if it was all in a file on a computer. (physiotherapy student)
- Much easier to access. Much easier to read! You can't lose it! (nursing student)
- …it certainly feels more personalized, it's been read and analyzed. (radiography student)

Learners were particularly positive about the availability of the feedback with the assignment:

- It's with the work, so it's easy to see mistakes being talked about. (radiography student)
- Good, more structure feedback. You can see what and where the assessor has guided you. (nursing student)

Further benefits identified included environmental factors such as reduced printing and digital notification of when feedback was available.

Perceived Barriers to Feedback and ePortfolio

Again, participants focused on receiving feedback on their summative assessments in the ePortfolio. Noted barriers focused on the system and its robustness as well as concern about data protection and general reliability. Other technical issues raised by a minority of learners included access to the correct version of software and timing out of system sessions. Inevitably learners were concerned about the time taken to learn how to use the system and being able to access feedback quickly:

- The thing is about basically finding how it works... because it's a software, you actually have to go in and play around, spend a lot of time, see how it really works and then start doing things with it. (physiotherapy student)
- Takes longer, reading each comment, I do prefer feedback on one form that is easy to look over again. (radiography student)

While the ePortfolio had the potential to support further and more diverse engagement with feedback, some learners found the wide-range of options available in the ePortfolio tedious and were further confused by the obscure terminology within the system.

Discussion

Our study originated from an acceptance that feedback is vital for learning; however, in healthcare programs feedback can be complex and provided in less than ideal circumstances. It was hoped that the affordances of the ePortfolio system would encourage greater learner engagement with and learning from feedback, which has to date been found to be problematic.

Our participants were very positive about receiving tutor-generated feedback on the product of their learning through the ePortfolio (the summative assessment): it was much easier and quicker to access and to return to this feedback compared with paper-based feedback, which is often lost. Some learners did indeed return to feedback in the ePortfolio more than once and read it, especially when prompted by tutors and after they had been introduced to the ePortfolio as a tool for long-term professional and personal development. Those that did return to feedback (usually in case studies 2 and 3) often reflected upon it, used it as a springboard for internal reflective or external dialogue, and planned for future learning activities. The wider role of the ePortfolio as a tool to self-generate feedback or to collate, collect, and reflect on feedback by learners across a program was, however, infrequently considered and used by learners.

Through our research it became apparent that learner 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. Feedback was often seen as a type of response to a learner's action – an error correction – providing
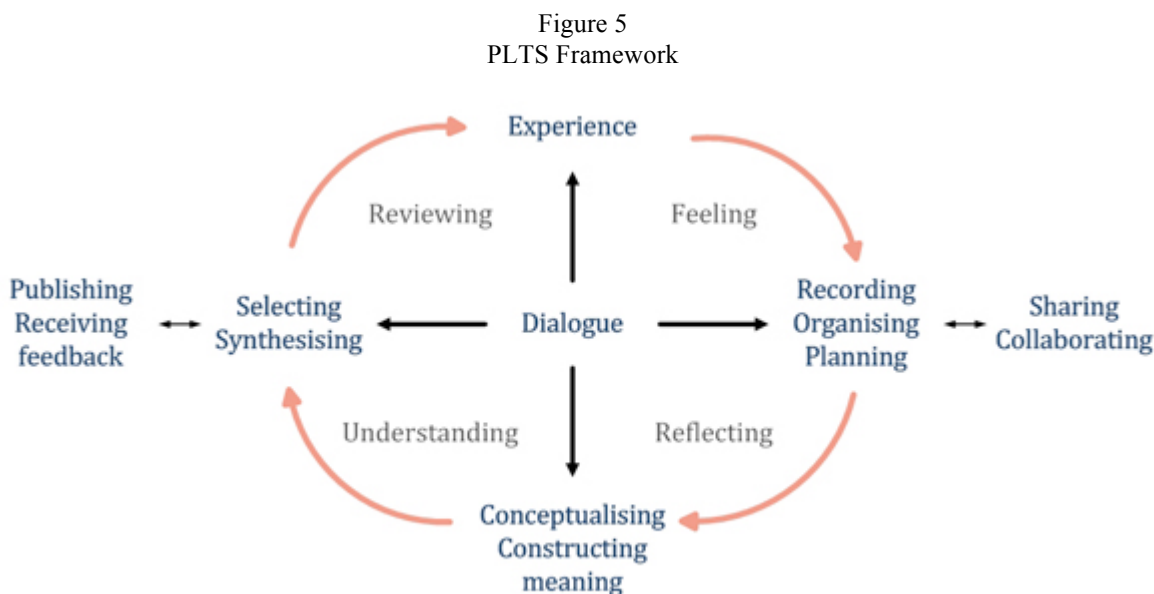
Figure 5
PLTS Framework

Figure 5. © 2011, JISC infoNet. Used with permission.

specific information about the level of progress to date (linked to the grade this indicates whether they were on the right track and if they had met the appropriate standards) as well as areas for improvement about the specific task, outlining their strengths and weaknesses and offering signposting for improvement.

- …because otherwise you would just be trouping on without any sort of way to gauge how you were doing, how you were … you could be going completely off in the wrong direction, and you need someone to say 'hang on a second, go this way' …and direct you a little I suppose. (radiography student)
- If they didn't evaluate our work then we will never improve, it's better to enhance it from now than to be in the field and don't know how to do it. (radiography student)

However, there appears to be little learner understanding of the complexity of feedback and especially its role as a tool for the development of meta-cognitive skills and self-regulation to support lifelong learning. This understanding of feedback is combined with a passive perspective of the learner's role in the process: feedback is something that should be provided to them as part of their implicit agreement with the tutor and the institution but there is little understanding of what to actually do with feedback once received (Middleton, Nortcliffe, & Owens, 2009).

Our findings concur with emergent research into effective ePortfolio implementation, which emphasizes that ePortfolios must be integrated into the curriculum with full technical and pedagogical support available for learners and tutors (Joyes, Gray, & Hartnell-Young, 2009). These approaches address some of the misconceptions associated with ePortfolios, for example, that as "digital natives" (Bennett, Maton, & Kervin, 2008), learners instinctively know how to use new technology and to use it to further their learning. More examples that are pertinent to this study are shown in Table 9 (Joyes, Gray, & Hartnell-Young, 2009). ePortfolio implementation is a highly complex area and there are key threshold concepts that are central to their success. Although this is a novel body of knowledge that is still in development in relation to ePortfolios, we have applied this to our implementation in order to understand both the successes and the challenges of our implementation and as a basis for future discussions with tutors (JISC infoNet, 2011). Table 9 shows how four of these Threshold Concepts relate to the practice described in this paper.

After reviewing our implementation it became apparent that most learners need guidance in how to use their ePortfolio to support deep learning from feedback. The PLTS framework (see Figure 5), based on Kolb's cycle of experiential learning (JISC infoNet, 2008) provides an ideal guide to help learners not only engage with feedback provided by tutors on the product of learning but also to help learners reflect on the process of learning in which they will receive and create much feedback.

Using this cycle, tutors may demonstrate to learners how the ePortfolio can be used to:

Table 9
An Analysis of ePortfolio Implementation with Regard to Threshold Concepts

Threshold concept	General misconceptions	Approach taken by QMU	Area for development
1. *Purpose*			
The purpose(s) of the ePortfolio must be aligned to the particular context. Purpose in this context is 'Supporting reflection and feedback'	Users will work out how to use ePortfolios to suit their needs.	Purpose made clear and directly related to professional practice, by tutors, at the start of the module.	Although tutors articulated the purpose of the ePortfolio to support both the product and process of learning, most of the learners used their existing approaches to feedback and hence used the ePortfolio mainly as a feedback delivery tool (product).
2. *Learning Activity Design*			
There must be a conscious design and support of learning activities.	The curriculum remains unchanged.	Scaffolding and support for tutors and learners. ePortfolio use integrated into program.	Although the ePortfolio had been integrated into the curricula, its implementation focused on the product of learning. More learner guidance is required to ensure the ePortfolio is used to support deeper learning from feedback.
3. *Processes*			
The processes involved in the creation of the ePortfolio in this context must be understood and both technical and pedagogic support needs to be provided.	Students are digital natives so easily able to adopt new technologies and know how to use in their studies.	Full technical and pedagogical support available for both learners and tutors.	Learners and tutors had technical support but more holistic support is required to help develop a wider understanding of the potential for ePortfolio and feedback for the processes of learning.
4. *Transformative and Disruptive Nature*			
ePortfolios are disruptive from a pedagogic and technological perspective.	An ePortfolio can simply replace a paper-based system.	Tutors encouraged learners to not only read feedback but reflect and plan for future learning opportunities. The ePortfolio was introduced as a wider tool for engagement with feedback.	Learners reverted to comfortable and tried and tested approaches to feedback. Only with significant tutor support could familiar patterns of working be transformed.

- Record, collect, and collate feedback. This may be feedback provided by tutors on work published through the ePortfolio. Alternatively it may be feedback provided verbally on placements or text-based feedback on other assignments in their studies.
- Synthesize learning from feedback. Healthcare learners are given feedback in many different learning environments. The ePortfolio system can not only store this but also help learners to review and then link to learning and synthesis.
- Reflect on this feedback from many different sources. This provides the opportunity for learners to consider how feedback impacts their current theoretical knowledge and their emerging skills and competencies.
- Organize and plan for future learning opportunities.

It is anticipated that this model would help learners to develop a wider understanding of feedback and its complexity and purpose in their learning.

To benefit from this model, learners will also need guidance in becoming more active agents in the feedback process – the transformative role of the ePortfolio. Many of our learners did not envisage that they had more than a "recipient" role in the feedback process (it was something provided to them); therefore, they could only visualize ePortfolio as an electronic delivery system of their entitled feedback on the product of their learning. In healthcare education, learners need to be proactive in not only ensuring they receive feedback but also in seeking out feedback from as many sources as possible; further, they must use this feedback for reflection on both the product and processes of learning. Peer feedback and support is an important part of professional practice, and encouraging this as part of the programs could enable learners to better understand the role of feedback in their studies. The model may also support tutors in designing learning activities to encourage learners to embed feedback into their learning.

Limitations of the Study

Limitations of this study relate to participant recruitment, research tool design, and timing of the study, as well as some technical difficulties with the institution's installation of QSR NVivo8, a software tool for aiding qualitative analysis, which resulted in much of the analysis stage being conducted manually by the team. These issues are discussed in more detail elsewhere together with our recommendations for future studies (Peacock et al., 2011).

Conclusion

Through our small collective study we have sought to build a rich picture of learner engagement with feedback and ePortfolio. Our research indicates healthcare learners are cognizant of the importance of feedback in their learning, but their current models of feedback, and moreover how to interact with it, frequently impede the effectiveness of the ePortfolio in supporting deep learning from feedback. Nevertheless, in a few cases where ePortfolios had been integrated across a program and appropriate tutor guidance had been provided, a small number of learners had begun to use feedback provided through the ePortfolio as a springboard for deeper learner and planning for future development. Moreover, a few learners had started to explore the ePortfolio tool to support the process of learning. Clearly most learners need guidance and models to ensure they benefit from feedback and use

the ePortfolio effectively for on-going personal and professional development. As educators we are still in the formative stages of our implementation of ePortfolios and further research is required to explore its future roles especially regarding feedback. Even so, the ePortfolio has the potential to change radically the ways in which feedback is given to learners and how they use this feedback to support their deeper understanding of their subject and practice in healthcare.

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