

User Perspectives on the Pedagogical Differences Between Electronic and Paper Portfolios

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ABSTRACT

This paper reports on a formative examination of the pedagogical impact of e-portfolios recently introduced to postgraduate medical education at the Bradford NHS Trust and undergraduate/postgraduate healthcare training at the University of Leeds. Early results suggest that there are differences emerging in the learners' perceptions of the development of reflective skills, ownership of work and the ability to present evidence for assessment depending on whether the students are using a paper or electronic portfolio. Preliminary findings also suggest that to be successful, e-portfolios need to have support from the users and their supervisors/mentors who provide feedback. The paper will also highlight issues for further discussion and future investigation such as the nature of ownership, assessing reflective ability and learning, time issues, and feedback.

Keywords

E-portfolio, portfolio, medical education, healthcare, reflection, ownership, support.

INTRODUCTION

This paper reports the preliminary findings of a formative evaluation examining the introduction of e-portfolios to postgraduate medical education at the Bradford NHS Trust and undergraduate/postgraduate healthcare education at the University of Leeds. This study forms part of the Enhancing Learner Progression project, funded by the JISC Distributed e-Learning Programme (www.jisc.ac.uk/index.cfm?name=bradfordelp&src=alpha), which is exploring the application of e-portfolios at key transition stages in the Student Lifecycle (Bradford, 2004). This paper addresses the pedagogical impact of using e-portfolios to support students at stage five of the model: student success and employability through achievement and preparation for work.

PORTFOLIOS IN MEDICAL AND HEALTHCARE EDUCATION

Paper Portfolios

Paper-based portfolios have been used to evidence and record professional competences for a number of years, particularly in teaching and healthcare and there is evidence to support the potential of portfolios as tools for enhancing learning and development (Orland-Barak, 2005). They can provide authentic assessment activities that are grounded in "genuine reality" (Dewey, 1897 cited in Smith, 2001) and one of the key design features of authentic activities is that they include reflection as a core element (Reeves et al, 2002). This is also a key requirement of professional practice in medicine and healthcare (Modernising Medical Careers, 2005). However in some cases it has been reported that portfolios do not always promote reflection and can, in fact, hinder the reflective process (Pearson and Heywood, 2004).

The act of recording and compiling information for a portfolio is a learning experience in itself that draws directly on the individuals' everyday experiences, whether at work or studying.

"Authentic assessment revolves around building a professional portfolio that serves simultaneously to document learning and builds a means that reinforces professional employment." (Hill & Irvine, 2003, p7)

Portfolios can also offer benefits covering a range of different developmental areas. For the individual, they can help personal growth, career development and professional development. For the organisation, they can help in knowledge management, performance management and organisational learning. A portfolio can:

- promote reflective learning and practice (Joyce, 2005 and Hartnell-Young & Morriss, 1999),

- support personal development planning (Hartnell-Young & Morriss, 1999 and Challis, 1999),
- help relate theory to practice (Joyce, 2005 and Challis, 1999),
- promote self-esteem and confidence (Mathers et al, 1999 and Hartnell-Young & Morriss, 1999),
- increase self-knowledge (Mathers et al, 1999 and Hartnell-Young & Morriss, 1999),
- encourage learner autonomy and self-direction (Joyce, 2005 and Challis, 1999),
- provide organisational benefits (Hartnell-Young & Morriss, 1999).

Portfolios can act as a tool to alleviate *Pedagogical Amnesia* (Schulman, 1998) by making learning stand still long enough to be examined, shared and learned from (Schulman, 1998 cited in Darling-Hammond et al, 2000).

However, since we are now in the information age the issue arises as to whether we can and should move these paper-based portfolios to electronic form. Can e-portfolios improve on the process or are e-portfolios an alternative but not better way of compiling a portfolio? What we will investigate here is whether the change from paper-based portfolio to e-portfolio offers the same, or additional pedagogical benefits, from the perspective of the learners.

e-Portfolios

The attributes of paper-based portfolios outlined above broadly match the individual and organisational objectives of the ELP project in using e-Portfolios:

1. Aid personal development planning, enable recording of achievement, and provide tutor, peer and self-assessment tools to support progression from higher education into work.
2. Provide electronic evidence of achievement that can raise aspirations.
3. Facilitate student progression into work by enhancing the student experience in work-based placements.
4. Support and develop work-based teaching staff by providing guidance and training on e-portfolio systems.
5. Establish good practice guidelines in e-support of students prior to entry and after graduation - in particular access to content and services.

However, although e-learning has been used in undergraduate medical and healthcare for a number of years (Driessen et al, 2003) its use has predominantly focused on developing students' reflective capabilities (Hennessy et al, 2004) and using technologies to facilitate learning within undergraduate courses, for example the virtual town developed by the Dublin City University (<http://www.dcu.ie/nursing/elearning.shtml>) and the International Virtual Medical School Project (<http://www.ivimeds.org>). There has been some use of portfolios in professional practice (Snadden et al, 1998) but very few of these applications have focused on the transitions between graduate and postgraduate study, between theory and practice, and from traditional learning environments to work-based settings.

Many authors writing about e-portfolios recognise that good practice comes from the tradition of paper-based portfolios (eg Woodward & Nanlohy, 2004) and that technology should be used to support learning through the portfolio process and not drive it (Hartnell-Young & Morriss, 1999). However e-portfolios can offer additional benefits to those offered paper-based portfolios including:

- greater flexibility in terms of when, how and with whom it can be shared (Greenberg, 2004),
- multi-purpose use where it is easier to repackage digital data for different uses and purposes (*ibid*)
- multimedia, interactivity which appeals to different learning styles and which can be more interactive for the audience and non-linear (Woodward & Nanlohy, 2004)
- improved communications by allowing greater scope to share with others and get feedback (Greenberg, 2004)
- publication benefits which can improve presentation, motivation and self-confidence (Clegg et al, 2005 and Armitage, 1998 cited in Woodward & Nanlohy, 2004)

However one of the most important difficulties with portfolios and e-portfolios revolves around their assessment, whether that is assessment for qualifications, professional competence or performance review. In

order to assess or evaluate a portfolio it must be seen by others. This could lead to users being reluctant to express their thoughts and feelings honestly (Snadden & Thomas, 1998) and “*recording weaknesses as well as strengths may be seen as threatening*” (Joyce, 2005, p459). Joyce (2005) in her review of literature also raises the following assessment based issues: reliability and validity of assessment, assessment led rather than learning led, privacy and confidentiality issues. It is also of concern, given that portfolios are increasingly advocated for professional development, that there is no definitive evidence to suggest that portfolio learning leads to improved practice. Joyce (2005, p459) notes that portfolios “*could lead to improvements in practice*” but the “*links ...were not clear*” (Harland, 2005, p335).

This paper reports preliminary findings on the application of e-portfolios to support medical and healthcare students in making the transition from formal study to work-based learning.

THE PILOT

Two cohorts were chosen to pilot the e-portfolio in two different work-based contexts in medicine and healthcare:

- Pre-registration House Officers (PRHOs) – graduate medical students undertaking the first year of their two-year professional foundation programme in a professional environment, and
- Nursing students – undergraduate and postgraduate healthcare students who are studying nursing.

These two contexts comprise thirty-nine postgraduate medical students (PRHOs) based at a regional hospital and a group of 10 (out of a cohort of 60) volunteer nursing students (nurses) studying either an undergraduate or postgraduate nursing course on work placements. A further 29 students on an alternative pathway on the undergraduate nursing course joined the project in October 2005 but at the time of writing have not yet been on clinical placements and are not included in the evaluation results reported here.

PRHOs

Over the last five years pre-registration medical training has undergone a series of changes with an increased focus on learning from reflection. The Modernising Medical Careers website states that:

‘Streamlined training and explicit standards of assessed competence are ... essential’
(Modernising Medical Careers, 2005).

As part of this new curriculum, a new paper-based foundation year portfolio (NHS, 2005) was developed to enable this new vision and all PRHOs must complete the portfolio before they can be registered. The foundation programme e-portfolio developed for this project was adapted from this paper-based assessment tool and the 39 participants on this pilot are required to complete it. PRHOs in other hospitals in the region are completing the paper-based portfolio, and one of these groups (30 non-users) is included in the evaluation.

Nurses

The Nursing e-portfolio was developed by the School of Nursing at the University of Leeds and was designed to assist students in recording their assessments and observations whilst on clinical placement. This pilot group comprises 10 student nurses from a cohort of 60 whose use of the e-portfolio was voluntary (10 nurses; 50 non-users).

The pilot e-Portfolios

The pilot e-portfolios for the PRHOs and nurses contain learner reflections on practice which the learners can choose to make public or keep private. Formal assessments are uploaded by the learners who receive feedback from supervisors on their performance and progress.

EVALUATION

This formative survey was carried out six months into the e-portfolio’s implementation. It is a developmental view that will inform ongoing practice, further e-portfolio development, and shape of the summative evaluation which will take place 12 months into the pilot. This paper reports on formative evaluation data that was collected at the mid-point of the pilot group e-portfolio usage and highlights the views and impressions of using the e-portfolio to date. This formative, developmental evaluation focuses on three pedagogical aspects of the e-portfolio tool:

1. Facilitating reflective learning,
2. Enabling students to receive regular feedback on performance,
3. Enabling students to present evidence for assessment within guidelines.

The foundation year process is new to all hospitals, medical staff, student supervisors and PRHOs and no comparison in terms of development from previous years can be made. Similarly the e-portfolio is new to the nursing students. The evaluation focuses on a comparison of the results collected from e-portfolio users and non-users from both groups of participants.

Evaluation data was captured using online surveys with PRHOs, nurses and some supervisors. The survey asked the two groups (users and non-users) to rate their own abilities in key areas:

- organisation,
- presenting evidence for assessment within guidelines,
- assessing their own strengths and weaknesses,
- planning their careers,
- defining goals,
- being able to reflect on their work and situations.

The survey also asked respondents to rate how they felt they had coped:

- in a work setting,
- with patients,
- with balancing their work and study/assessments.

Initial returns have been very low due, in part, to difficulties in negotiating access to the PRHOs and their supervisors at this early stage of the project. The e-portfolio user data below reports feedback from six PRHO users from a potential 39; four nurse users from a potential 10; additional feedback was also obtained from two nursing supervisors/mentors; no PRHO supervisors have yet returned any feedback. Feedback was also obtained from five PRHO non-users from a group of 30; no feedback was obtained from any of the nurse non-users.

RESULTS

Initial evaluation results illustrate that in terms of ability to organise, being able to assess own strengths and weaknesses, planning of work and careers and defining goals there were no differences in the perceived abilities of both user and non-user groups. However there were differences in responses to questions about reflective learning, time, ownership, feedback and presenting evidence for assessment. These are discussed below.

Reflective Learning

The limited results available from the users of the e-portfolio mid-point survey can only be suggestive in identifying areas for further exploration but some issues have emerged. There may be differences in the way the two user groups, PRHOs and nurses, use the e-portfolio. The table in Figure 2 below documents the numbers who have used the reflective section of the e-portfolios.

	Nurses e-portfolio users (n=4)	PRHO e-portfolio users (n=6)
Number who have used the 'Reflection and Skills' section of the e-portfolio	2 (66%)	5 (83%)
Number who found this the most useful section of the e-portfolio	2 (66%)	1 (16%)

Figure 2: Response to use and usefulness of the reflective section of e-portfolio

Five times more PRHOs reported using the 'reflection and skills' section of the e-portfolio than reported finding it useful, while the same number of nurse users reported using 'reflection and skills' section of the e-portfolio as those that reported finding it useful. Beyond that it is difficult to compare the two sets of users because the differences in their e-portfolio setups. PRHO users were asked to rate the usefulness of PDP, reflective practice, summary of evidence presented, self-appraisal, careers management and end of placement self-evaluation form. One PRHO user reported the PDP section as the most useful part of the e-portfolio but none of the other PRHO users responded to this question. Nurse users were asked to rate the usefulness of reflection and skills, notepad, personal information, academic advice and support, assessments, cluster documents, case management module and clinical skills recording and self-assessments. Nurse users identified three additional areas as most useful (notepad, academic advice and support and cluster documents) with one voting for each area. Does the poor response of the PRHO users indicate that they have found nothing useful from the use of e-tool?

All users were then asked if the e-portfolio had enabled them to improve any of their skills in five areas, including 'improve your skills on reflection'; one of the PRHOs said it had helped them to improve their skills of reflection with the other five stating that it had not helped. Two of the nurses felt that their skills of reflection had increased through the using the e-portfolio and only one said it had not helped. Both users of the e-portfolio and non-users were also asked how they rated their skills of reflection and the results are reported in the table in Figure 3 below. Two PRHO users rate themselves as excellent reflectors compared to zero non-users but they do not link this with the use of the e-portfolio.

How do you rate your skills of reflection?	OK	Good	Excellent
PRHO e-portfolio users (n=6, 1 non-respondent)	3	0	2
PRHO non-users (n=5)	3	2	0
Nursing users (n=4)	3	1	0
Nursing non-users (n=0)	0	0	0

Figure 3: How good are you at reflecting on your work and situations?

Perhaps by placing the emphasis of the question on just the reflective section we miss the point that the entire e-portfolio acts as tool for facilitating reflection. The PRHO users noted that using the tool had *"Made them think about things that they wouldn't normally think about"* and that *"It's good to have everything in the one place"*.

Users also store their assessments online in their portfolios which enable them to access all their entries and competences in one area. Overall three users (1 nurse, 2 PRHOs) felt that the e-portfolio had helped them to track their competences, with two (1 nurse, 1 PRHO) stating that it *sometimes* helped them in this process. One PRHO and two nurses also believed that the use of the e-portfolio had enabled them to record their achievements with one additional nurse respondent stating that it sometimes helped them to record their achievements. Both of these aspects are important pre-requisites to enable reflection to successfully take place.

Time

The amount of time spent on assessment recording, reflection and self-appraisal activities was another major difference between the 2 groups. The e-portfolio users spent on average 5.2 hours a month on these activities compared to the non-users 6.1 hours. Is this reduced amount of time spent on these activities as a result of e-portfolio usage and the ability to access work in the one place or do the e-portfolio users already possess higher levels of ability in reflection?

Ownership

When questioned about the ownership of their respective portfolios none of the PRHO users felt that they 'owned' their portfolios whereas four out of the five non-users felt they owned the work in their portfolios. By contrast all four of the nurse users felt that the work in the e-portfolio was theirs.

Users have the option of keeping reflective entries private but to be able to fully use the e-portfolio as a reflective tool supervisors and mentors need to be allowed access to these entries to enable them to discuss them with the learners and so facilitate learning. One clinical supervisor recently stated that there should be no private sections for reflection as he would like to know exactly what his trainee was thinking. *'This is the only way they can learn!'*

Feedback

Feedback is seen by many to be pivotal in the learning cycle (Kolb, 1984) and learners cannot effectively carry their learning forward without it. As we have already noted, one important advantage of using an e-portfolio rather than a paper-based portfolio is the ability to communicate with learners at remote locations, enabling feedback to be provided quickly and directly and from multiple sources.

We asked the users and non-users how often they received feedback and the results are shown in graph in Figure 4 below. It appears that the non-users are more likely to receive feedback on a monthly basis with more of the e-portfolio users receiving feedback less regularly. The electronic messaging mechanism of the e-portfolio should facilitate the feedback process, but, this can only happen if both student/trainee and supervisor possess the appropriate skills. However, it is interesting to note that when asked how often they would like to get feedback five PRHO users stated they preferred monthly feedback, one commenting that *'frequent formal feedback is not necessary'* suggesting perhaps that there may be more informal feedback occurring which is not recorded in the e-portfolio.

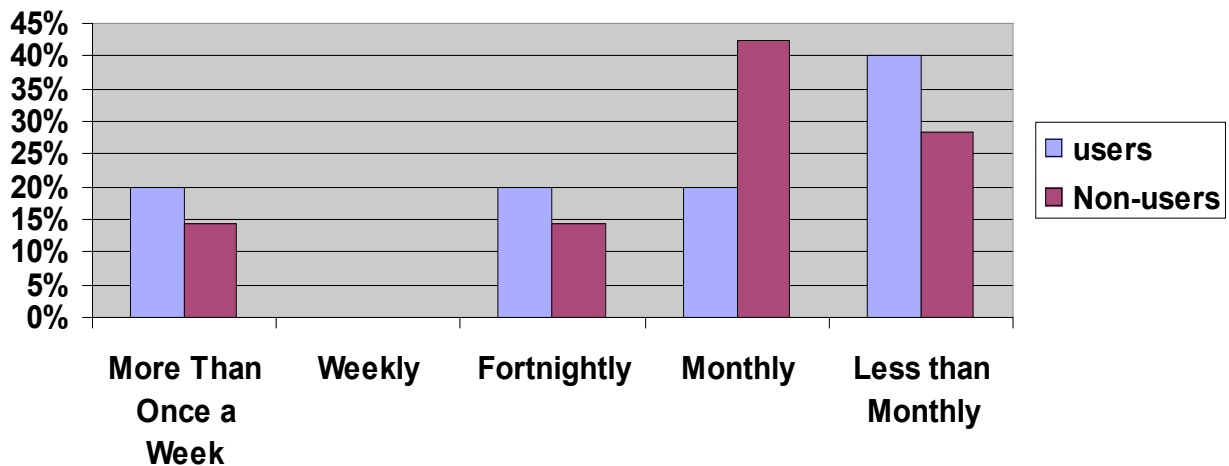


Figure 4: Frequency of Feedback on Portfolios (users and non-users)

When asked if they faced any difficulties in using the e-portfolio two PRHO users and one nurse user respondents stated that they had trouble granting permission to their educational supervisors to view their work. One student nurse commented *"I had granted permission for my supervisors to comment on my placement reports but I was unsure if they could see them"*

There were also some initial technical problems with access rights and permissions at the start of the project which may have slowed down the initial feedback process.

Presenting Evidence for Assessment

The ability to present evidence in standard and flexible formats is one of the main advantages of portfolio assessment. The users of the e-portfolio assessed themselves as being more able to present evidence for assessment than the non-users. Two of the non-users classed themselves as being below average in this aspect, with three non-users stating they were good. In contrast, only one PRHO user and no nurse users perceived themselves as below average; three users perceived themselves as 'OK' with four claiming they were good or excellent. One of the users stated that the evidence *'looked more presentable.'* E-portfolio's do appear to increase the users' abilities to be able to present evidence against assessment guidelines and benchmarks with one PRHO user noting that *'Everything is in one place making it easier to piece together.'*

ISSUES FOR DISCUSSION AND FUTURE EVALUATION

A number of issues have emerged from this evaluation that require further investigation and study in relation to this pilot. These include reflective learning, time, ownership and feedback and they are discussed below.

Reflective Learning

Piaget (cited in Kolb, 1984) suggests that the learning process of adults utilises internalised reflection. Do portfolios and, namely, e-portfolios assist in the externalisation of this process? Although the data are only

indicative they suggest that we need to investigate further whether the PRHOs view reflection of skills as an on-going process and useful skill for learning or whether they view the process as something that they leave behind in their undergraduate years. The data also suggests that it would be interesting to investigate whether some PRHOs emerged from university with better reflective skills than others or whether the use of the e-portfolio encourages the development of reflective skills without users realising it. This would require identifying and implementing an '*objective measure of reflection*' which Pearson and Heywood (2004, p87) argue does not exist. The data also raises the question as to whether the setting in which the e-portfolio is used affects the pedagogical outcomes of e-portfolio usage, i.e. Do people see the e-portfolio as a reflective tool in an educational setting rather than in a work-based setting? And, if so why?

Time

e-Portfolio users appear to spend less time on developing their portfolio than non-users. Is this reduced amount of time spent on these activities as a result of e-portfolio usage and the ability to access work in the one place or as highlighted above do the e-portfolio users actually have higher levels of ability in reflection?

Ownership

Both of the PRHO portfolios (users and non-users) are assessment tools, although the majority of non-user respondents expressed feelings of ownership over its contents when compared to the e-portfolio users. This raises a potential concern that this perception could hinder and restrict the type of entries and information the users place in their portfolios. We need to examine this issue more closely and explore ways of overcoming it if recording learning and assessment in the medical profession is to be truly learner-centred and electronic.

Feedback

The limited evidence indicates that the use of the e-portfolio has not increased the frequency or level of feedback but there does appear to be a suggestion that informal feedback is being given more frequently and that the users regarded this as different to formal feedback. These are issues that could be productively explored in the summative evaluation which may reveal changes to the frequency as the e-portfolio is increasingly used and supervisors and learners feel have more experience in using the system.

CONCLUSIONS

When asked why they would like to use an e-portfolio all the non-users stated that the biggest advantage would be the storage of paperwork. Four non-users also stated that it would make it easier to track progress hinting at some perceived pedagogical benefit of collecting electronic rather than paper-based evidence. At this formative point of the project there are some interesting trends emerging from the use of the e-portfolio in place of a paper-based version and some pedagogical benefits are emerging:

- Students/trainees feel better able to present evidence for assessment within guidelines and learning outcomes and track their progress against competences.
- Users within a full-time education setting feel that the use of the e-portfolio has increased their ability to reflect on work and learning.
- The functionality to have everything in one place has been mentioned many times by users as an advantage of using the e-portfolio.

But we need to ensure

- that the E-and ICT competencies of the e-portfolio users, both trainees and supervisors are assured through the provision of robust training and on-going support.
- that PRHOs develop a sense of ownership over their work within the e-portfolio.

The use of portfolios may alleviate Schulman's 'pedagogical amnesia' but further evaluation and development will be required to measure if e-portfolios have the same impact on the learning process.

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