Supporting Student e-Portfolios

Tracey Madden
Physical Sciences Centre
Department of Chemistry
University of Hull
HU6 7RX

t.madden@hull.ac.uk

Abstract
Historically, the term portfolio has been used to describe a folder of work used predominantly for skill recording and display purposes. It was mainly paper based, usually begun when its author was a student and developed over a working lifetime. More recently the term has been taken up for use in schools and colleges, describing a more modest folder holding work from a particular project or an entire course, and in professional fields as a collection of material required to evidence competence for accreditation or to prepare for assessment.

Since its inception as an evolution of this traditional portfolio, the electronic portfolio or e-portfolio has attracted a great deal of interest from around the world where there is ready access to suitable technology. This interest continues to grow with increasing numbers of students and professionals being encouraged, or required, to produce e-portfolios. This article focuses on e-portfolios in the higher education (HE) sector, principally those authored by students. Its purpose is to provide a basic introduction to e-portfolios: what they are, how they are being used, potential benefits and challenges, and guidance for their successful introduction.

Introduction
Historically, the term portfolio has been used to describe a collection of work, mainly paper based, usually begun when a student and developed over a professional's lifetime, predominantly by those in the arts fields. More recently, it has been taken up for use in schools and colleges, describing a more modest folder holding work from a particular project or an entire course. In professional fields, the term is often used to describe a collection of material required to evidence competence for accreditation or to prepare for assessment.

a student e-portfolio is an archive of material, relating to an individual, held in a digital format.

In the early 1990s the *electronic portfolio*, or *e-portfolio*, began to emerge as an evolution of the traditional portfolio but taking advantage of the increasing availability of digital media. Interest continues to grow with increasing numbers of students and professionals being encouraged (or required, within the health sciences and legal fields) to produce portfolios. This is supported by a wide array of software packages designed specifically for their creation and dissemination.

What is an e-Portfolio?
This should be but is by no means a straightforward question[1]. A possible definition, the one that will be used here, is that a student e-portfolio is:

an archive of material, relating to an individual, held in a digital format.

Examples of actual student e-portfolios
- University of Warwick
  http://www2.warwick.ac.uk/cll/skills/eportfolio/crs/examples/
- LaGuardia Community College
  http://eportfolio.lagcc.cuny.edu/basic_gallery.html
- eFolio Minnesota
  http://www.efoliominnesota.com/
- New York City College of Technology
  http://eportfolio.citytech.cuny.edu/
- St Olaf College
  http://www.stolaf.edu/depts/cis/web_portfolios.htm

Though professionals and institutions may generate their own e-portfolios, this article focuses on students as the principal authors.

e-Portfolio Contents
The main contents of an e-portfolio are typically:
- evidence of achievement
- author statements about the evidence
- feedback on the evidence
- other personal material pertaining to the author

In North America, where e-portfolios first came to prominence, the contents tend to focus on evidence of achievement. In UK HE, e-portfolios tend to be used in the context of *personal development planning* (PDP) so a balance of material is encouraged. The actual contents of an e-portfolio will depend on the student, purpose of the e-portfolio and the intended audience.

e-Portfolio Uses
An e-portfolio is very flexible and has many possible uses, including:
- storing materials
- sharing materials with an outside audience
- aiding self analysis
- supporting academic and profession goals
- supporting external assessment

A single e-portfolio may be used for more than one purpose or it may be more straightforward for a student to construct a number of different e-portfolios, a view postulated in *Becta's View: E-assessment and e-portfolios* [http://ferl.qia.org.uk/display.cfm?resID=13337].

Types of Student e-Portfolios
Generally, student e-portfolios fall into two main categories:

Developmental student e-portfolios
These include:
- *transitional* - those aimed at facilitating transfer of data
- *learning* - those aimed at supporting self-development activities and processes, such as PDP or work placements

Presentational student e-portfolios
Also frequently referred to as *showcase*, this type is used in support of the author, for instance in the case of:
- applying for a course of study/job/work placement
- building CVs
- external assessment
- accreditation
- appraisal

e-Portfolio Assessment
Opinion is divided on both whether e-portfolios should be used for assessment purposes and if so, how this should be undertaken.

Methodologies
e-Portfolios can be used for formative and summative assessment[1,2]. The assessment itself may be done in a manner which looks for evidence of learning gains[3] or by comparing it with scoring rubrics or standards[3,4].

Opportunities and Benefits
Supporters of e-portfolio assessment point out that it fits with the movement away from standardised testing and towards alternative or *authentic assessment*[4-7] providing a truer picture of the student's ability[8].

As well as this, e-portfolio assessment may offer other benefits, such as:
- increasing student reflection[9]
- revealing information not shown by other assessment methods[2]
- making students more active in assessment and their learning as a whole[3,10,11]
- giving students more ways to demonstrate their knowledge[5]
- making longitudinal studies possible[8]

Additionally the process may cause educators to reflect on course content and teaching methods[3].

Challenges
Even those who support e-portfolio assessment acknowledge the many challenges it can bring including:
- authenticating work[12]
- deciding what constitutes 'good' work[13]
- uniformity of assessment between assessors[9,14]
- the time necessary to read and assess work[4,6,9]
- how to score evidence[9,12]
- whether the credit awarded appears to be proportionate to the time invested[15]
- whether the assessment is unduly influenced by the student's technical skills or lack thereof[12]

Teachers may feel that there is a conflict between their role as an assessor and as a mentor[16] and knowing how much guidance they can give to a student without challenging the 'ownership' of the e-portfolio[13]. Although it has been emphasised how important it is to include reflection[14] students have been known to object to having their reflections assessed[15].

Software Options
A range of options is available which subdivide into three basic types:
- in-house solutions (e.g. RAPID Progress File, LUSID)
- commercial software
  - dedicated e-portfolio software (e.g. *PebblePad*, *Folio*)
  - generic software tools (e.g. *SharePoint*)
- open source software (e.g. OSP *ePortfolio*, PETAL)

In the course of her research, Helen Barrett has developed many versions of her own e-portfolio using a variety of open source and generic tools, including blogs, which can be viewed on her website at http://helenbarrett.com/myportfolio/versions.html#1

Making a choice
For those trying to decide which e-portfolio system to adopt, the CRA (The Centre for Recording Achievement) have developed a set of in-depth questions that should enable an institution to make an informed choice[42]. For those not in a position to make the choice it is important to understand what a system can offer so that it can be used to its best advantage.

Benefits
Potential Benefits of the e-Portfolio
Since the e-portfolio is very much an evolution of the traditional portfolio, many of the benefits arising from the construction and use of the traditional form can also justifiably be attributed to the electronic version[17] , such as:

- developing learning
- supporting self-assessment
- encouraging reflection
- fostering self-motivation

Academics themselves can benefit from the process of constructing an e-portfolio in terms of their continuing professional development (CPD) and by doing so, they are also uniquely prepared to help students do the same[18]. Indeed, it could be argued that students are unlikely to be convinced of the value of constructing an e-portfolio by those who have not engaged in the process for themselves.

Furthermore, the e-portfolio offers several benefits over the traditional portfolio[12,17,19-21].

Potential Benefits over the Traditional Portfolio

For the Student

Storage Space

An e-portfolio allows a relatively large amount of material to be stored and shared in a cost effective way, on either a CD or DVD, or online[6,22].

Data Types

Since they are electronic, e-portfolios can contain not just text data but material such as audio files, video files and slide presentations. Much of this is in an electronic format to start with which makes it more convenient to keep it this way[23].

Adaptability and Flexibility

It is relatively easy for material to be added, deleted, adapted or rearranged compared with that in a traditional portfolio, so it is much more likely to be kept up to date than its paper counterpart.

Audience access

If the e-portfolio is hosted on a web site, prospective viewers can be granted access by being given the site address and any necessary access permissions. The e-portfolio tool may also allow different arrangements of the material to be seen depending on the 'access' given to the audience.

Key Skills Development

Developing an e-portfolio gives individuals the opportunity to learn, develop and display key skills[12,18,22].

For the Employer

e-Portfolios have been said to offer a more 'authentic' analysis of an individual[8,23,24] because they offer a fuller picture of their achievements than, say, exam results.

For an Institution

Adoption of an e-portfolio programme for students offers several potential opportunities for the host institution[3,25,26] including:

- helping with student transition
- giving an insight into student progression through a specific course or in general
- offering the opportunity for dynamic course feedback from students
- helping to support work placements
- by showcasing student achievement it can also demonstrate the success of the institution
- encouraging institutional reflection and improvement

Challenges

Any new system, particularly one with a technological basis, offers its own challenges. These include:

Technical Challenges

e-Portfolio Tool Set

Whatever system is chosen it has to meet the needs of the users, be sufficiently straightforward for beginners, and yet be sufficiently flexible for the more advanced[15,24,27].

IT Support

The amount of support needed for both institution staff and students should not be underestimated particularly when the system is first introduced[28]. Staff and students will need training and to know that they can obtain assistance when needed[29].

Interoperability and Standards

With the increase in popularity of e-portfolios, key areas of interest are those of interoperability, which is the transfer of data from one system to another whilst maintaining its integrity, and standards. These issues are of particular importance when the e-portfolio is to be used to assist transition or to support lifelong learning (where ideally individuals would be able to start their e-portfolio at any stage in their lives and always be able to take it with them).

Access

Although the e-portfolio offers clear advantages over the traditional portfolio when it comes to allowing access this brings corresponding challenges, for instance:

- deciding who has permission to access the e-portfolio and who sets those permissions
- providing all students with appropriate access to their e-portfolio[30]
- deciding how long the institution will host and allow access to the e-portfolio after a student has left and if there will be a charge for this facility
- maintaining the security of the information in the e-portfolio

Resource Challenges

People

The most important resource will be the people involved:

- academic staff to introduce and support the project, including providing prompt feedback to students and guidance in reflection, which may be unfamiliar or problematic for some[31]
- technical staff to support the system
- support emanating from the top levels of the organisation

Time

Time is often cited as an important consideration when implementing an e-portfolio system[6,19,32]. Planning needs to be done to analyse the time demands of:

- training staff and students
- introducing the e-portfolio project
- providing technical and academic support
- giving feedback to students

and also how this may impact upon the curriculum.

All authors will need to be aware of the significant amount of time it may take to construct an e-portfolio and keep it up to date, especially in the early stages, but that this will become less of an issue as their confidence and proficiency increase.

Costs
For the institution, it is worth noting that costs include:
- the software and hardware, its installation, maintenance and repair
- possible additional storage as the size of e-portfolios and their number increase
- training for existing staff or employing and training new staff

Legal and Ethical Challenges
The main areas to consider are those of:
- data protection
- intellectual property rights, and
- accessibility

Data Protection
The **Data Protection Act 1998** (DPA 1998) seeks to establish the responsibilities of those who determine the gathering and processing of personal information and the rights of those who are the subject of that information. For certain types of e-portfolio system, the institution does not exercise any control over the data gathering or its use and is therefore not subject to the Act. In all other cases, the institution must inform the Information Commissioner's Office (ICO) of this and indicate the purpose(s) for which it intends to process personal information and the intended operational uses of the e-portfolio system[33,34].

Intellectual Property Rights
Intellectual Property (IP) Law seeks to protect works of human creativity and the rights of the creators and owners, whilst allowing public access. The main area of IP law in this context is copyright.

Copyright is governed by the **Copyright, Designs and Patents Act 1988** (CDPA 1988). Copyright ownership is generally held by the person who created the work, who then has rights over the work and how it is used. Institutions need to be fully aware of who owns the copyright on student work, as do students themselves. Awareness is paramount in avoiding problems in such instances where students include the work of colleagues or information from work placements in their own e-portfolios[33].

Disability Legislation
The **Special Educational Needs and Disability Act 2001** (SENDA 2001) requires institutions to take reasonable measures to ensure disabled students are not placed at a disadvantage and make reasonable adjustments where possible[33]. Institutions should also be aware of their responsibilities to their disabled employees under the terms of the Disability Discrimination Act 1995 (DDA 1995).

Other Legal and Ethical Issues
Institutions will be well advised to consider the implications of student e-portfolios containing material that might bring charges of, for instance, plagiarism or defamation when published, or leave authors open to the possibility of 'identity theft'[35].

Briefing papers on the topic of student plagiarism, its avoidance and detection, have been produced both by the HEA Physical Sciences Centre [www.heacademy.ac.uk/assets/ps/documents/briefing_papers/ps0005_plagarism_feb_2005.pdf] and by JISC (Joint Information Systems Committee) [www.jisc.ac.uk/uploaded_documents/JISC-BP-Plagiarism-v1-final.pdf]. JISC also fund the JISC Plagiarism Advisory Service (JISC PAS) for academics and students.
In the case of student e-portfolios, clear guidelines on content should be worked out as soon as possible along with suitable policy on the action to be taken if rules are breached.

Further Information on Legal and Ethical Issues
- Acts of Parliament can be viewed in full online and print copies obtained from the Office of Public Sector Information (www.opsi.gov.uk)
- A clear overview of the DPA 1998 can be found in the Data Protection FactSheet: What is the Data Protection Act (DPA)? produced by the ICO (www.ico.gov.uk)
- JISC Legal Information Service has commissioned a number of useful legal studies relating directly to e-portfolios, which can be obtained from their website (www.jisclegal.ac.uk).
- JISC Plagiarism Advisory Service (JISC PAS) (www.jiscpas.ac.uk)

Personal Challenges
A highly significant feature of any system is of course the people within it. All will come with their own attitude towards new technology and this can work both for and against e-portfolios. Some have found that the 'e' nature of the tool actually inspires and encourages people to engage with it[36]; however, negative past experience with technology or a feeling of insufficient previous experience can work against it. Level of initial technological expertise and access to technology cannot be assumed. This is equally true for both those who are building their e-portfolio and those involved in supporting them within the institution.

For some, attitudes towards e-portfolios or the PDP/CPD framework in which they are placed within the institution or profession can determine whether or not an individual wishes to engage with the process.

Positive support and encouragement from an institution, professional body or peers can do much to aid success[37,38]. It is generally agreed that the way the project is initially introduced has a significant impact on how the project is accepted[39]. This is why thorough preparation before the e-portfolio is launched is so important.

Successful Introduction of e-Portfolios
Once a system is chosen, sources[28,40,41] indicate many common recommendations which assist the successful implementation of an e-portfolio system:

- implementation and integration needs to be broken down into smaller projects which can be built upon
- from the outset it should be understood that this is a long term undertaking
- implementation will need support from above and 'champions' should be involved from the beginning
- the purpose of the e-portfolio needs to be clearly identified and integrated into the curriculum
- the programme may need to be mandatory at least in part or at the beginning to overcome initial resistance

Staff need:

- to be shown the possible positive outcomes to the venture and examples of best practice
- to see this as being in the interests of the student
- support and training to acquire the appropriate skills to support students including technical skills and giving feedback
- to go through the process of creating an e-portfolio themselves

Students need:

- clear reasons to get involved
- support and training to acquire appropriate skills and not be able to opt-out due to lack of skills
- to be given advice on choosing artefacts
- to be taught how to reflect
- encouragement and regular feedback
- to see good examples
- to know if and how the e-portfolio will be assessed

Further information about the implementation of e-portfolios, e-portfolio projects and case studies

- CRA [http://www.recordingachievement.org]
- JISC [http://www.jisc.ac.uk]
- EIfEL [http://www.eife-l.org]
- SURF [http://www.surf.nl]

Examples of e-Portfolio Use in UK HEIs

University of Gloucestershire
PebblePad is being used by most first year students studying in the Department for Natural and Social Sciences.

Kingston University
All level 1 students in the School of Pharmacy and Chemistry are offered support to use the ePortfolio tool on Blackboard.

Loughborough University
Loughborough's electronic PDP tool RAPID is used with Science and Engineering Foundations Studies (SEFS) students in the Learning and Communication Skills module.

Northumbria University
The ePortfolio tool on Blackboard is being used by first year students including Foundation degree students within the School of Computing, Engineering and Information Sciences.

University of Paisley
First year students in science & engineering use Blackboard to produce an e-portfolio.

University of St Andrews
The e-portfolio tool within WebCT/Blackboard is being piloted currently with level 3 students in physics and astronomy, moving to many first year students in the coming session.

University of Ulster
The University of Ulster has a Personal Development System (PDS), which includes an e-portfolio.

University of Wolverhampton
The *PebblePad* ePortfolio system is used by students, principally first year and second year undergraduates across the following subject groups: Biomedical Science, Environmental Science, Biological Sciences, Pharmacy, Physiology and Clinical Physiology. Some use is made by postgraduate students.

References

1. Smith K. and Tillema H. (2003) *Assessment & Evaluation in Higher Education*, **29**(2), 227.
2. Murphy S. M. (1997) *The Clearing House*, **71**(2), 81.
3. Nickelson D. (2004) *The Science Teacher*, **71**(4), 52.
4. Wade A., Abrami P. C. and Sclater J. (2005) *Canadian Journal of Learning and Technology*, **31**(3).
5. Archer J. (2007) *Education Week*, **26**(30), 38.
6. Corbett-Perez S. and Dorman S. M. (1999) *The Journal of School Health*, **69**(6), 247.
7. Wheaton Shorr P. (2005) *Scholastic Administr@tor*, **5**(1), 32.
8. Robins J. (2006) *Intervention in School and Clinic*, **42**(2), 107.
9. Van Sickle M., Bogan M. B., Kaman M., Baird W. and Butcher C. (2005) *College Student Journal*, **39**(3), 497.
10. Corwin T. (2003) *Campus-Wide Information Systems* **20** (1), 32.
11. Wall K., Higgins S., Miller J. and Packard N. (2006) *Technology, Pedagogy and Education*, **15**(3), 261.
12. Abrami P. C. and Barrett H. (2005) *Canadian Journal of Learning and Technology*, **31**(3).
13. Parsons J. (1998) *Adult Learning*, **9**(4), 28.
14. Niguidula D. (2005) *Educational Leadership*, **63**(3), 44.
15. Tosh D., Light T. P., Fleming K. and Hayward J. (2005) *Canadian Journal of Learning and Technology*, **31**(3).
16. Tillema H. and Smith K. (2007) *Teaching and Teacher Education* (article in press).
17. Strudler N. and Wetzel K. (2005) *Journal of Research on Technology in Education*, **378**(4), 411.
18. Anderson M. A. (2005) *Multimedia & Internet@Schools*, **12**(4), 34.
19. Heath M. (2005) *Library Media Connection*, **23**(7), 66.
20. Horton M. L. (2004) *Journal of Physical Education, Recreation & Dance*, **75**(9), 35.
21. Chalis D. (2005) *Canadian Journal of Learning and Technology*, **31**(3).
22. Keller C. A. (2006) *School Library Media Activities Monthly*, **22**(7), 56.
23. Heath M. (2002) *Teacher Librarian*, **30**(1), 19.
24. Carliner S. (2005) *T + D*, **59**(5), 70.
25. Gathercoal P., Love D., Bryde B. and McKean G. (2002) *Educause Quarterly Online*, **25**(2). Viewed online at http://www.educause.edu/apps/eq/eqm02/eqm022.asp
26. Lorenzo G. and Ittleson J. (2005) *An overview of e-portfolios*. Viewed online on http://www.educause.edu/LibraryDetailPage/666?ID=ELI3001
27. Barrett H. and Knezek D. (2003) *E-Portfolios: Issues in Assessment, Accountability and Preservice Teacher Preparation*. Viewed online at http://electronicportfolios.com/portfolios/AERA2003.pdf
28. Wickersham L. E. and Chambers S. M. (2006) *Education*, **126**(4), 738.
29. Hudson L. (2004) *Techniques*, **79**(5), 19.
30. Welzer K. and Strudler N. (2005) *Journal of Research on Technology in Education*, **38**(2), 231.
31. Darling L. F. (2001) *Teaching and Teacher Education*, **17** (1), 107.
32. Bobak R. A. (2004) *Distance Learning*, **1**(6), 1.
33. Charlesworth A. and Home A. (2004) *Legal Aspects of ePortfolio Systems: A Short FAQ*. Viewed online at http://www.jisc.ac.uk/uploaded_documents/Legal_Aspects_FAQ.pdf
34. Charlesworth A. and Home A. (2005) *Data Protection, Lifelong Learner Record Systems & ePortfolios*: A Short FAQ. Viewed online at http://www.jisc.ac.uk/uploaded_documents/Data_Protection_FAQ.pdf
35. McFadden J. R. and Saiki D. (2005) *Journal of family and consumer sciences*, **97**(3), 75.
36. Lebedeva M. and Shilova O. (2005) *Thinking Classroom*, **6**(4), 21.
37. Lippert R. (2004) *Techniques* **79**(7), 23.
38. Woodward H. and Nanlohy P. (2004) *Assessment and Evaluation in Higher Education*, **29**(2), 227.
39. Jorgensen L. M. and Hansen S. (2004) *Thinking Classroom*, **5**(4), 5.
40. Chappell D. S. and Schermerhorn Jr J. R. (1999) *Journal of management education*, **23**(6), 651.
41. Butler P. (2006) *A Review of the literature on portfolios and electronic portfolios*. Viewed online at http://eduforge.org/docman/view.php/176/1111/ePortfolio %20Project%20Research%20Report.pdf
42. Ward R. & Richardson H. C. (2006) *Getting what you want: implementing personal development planning through e-portfolio*. Viewed online at http://www.recordingachievement.org/downloads/Getting_What_You_Want.pdf