ePortfolio for all

eStrategies for empowering learners

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Papers for publication at the ePortfolio 2006 International Conference in Oxford – UK from 11 to 13 October

NB: The articles in this first publication are compiled in the alphabetical order of the first author's name. A later publication will provide a proper table of contents.

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*Window to Student Experiences – ePortfolio for ESL Students’ Digital Stories (abstract)* – Dale Doubleday, Nancy Meyers & Cheryl Colan, Phoenix College, USA.

*Using ePortfolios to Widen Participation and Opportunities for Students from Minority Ethnic and Lower Socioeconomic Groups (abstract)* – Neil Currant, University of Bradford, UK.

*Developing the skills for lifelong learning: towards a model of engagement in the ePortfolio process* – Christopher Murray, The University of Leeds, UK.

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*An ePortfolio for writing, editing and publishing students: Compendium for a career?* – Roslyn Petelin, The University of Queensland, Australia.

*ePortfolio as a tool for assessment of competences* – Mette Luplau Schnefeld and Hanne Toft, Centre for higher Education South Jutland/Business College South, Denmark.

*Should unsupervised web surveys be used to calibrate items?* – Javier López-Cuadrado, Anaje Armendariz & Tomás A. Pérez, University of the Basque Country, Spain.

*Adoption strategy for implementing & usage ePortfolios in International companies* – Mariya Gornostay, Kyiv National Taras Shevchenko University, Ukraine.

*The Challenge of implementing ePDP at the University of Abertay Dundee – Kehinde Oduyemi and Richard Ogston, University Of Abertay Dundee, UK.*

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*Determining the feasibility of utilising ePortfolios for functionally illiterate adults* – Mark A.M. Kramer and Ursula Maier–Rabler, University of Salzburg, Austria.

*Aiming for ultra–scalable ePortfolio distribution using peer–to–peer networks* – David Johnson, Ismail M. Bhana, ACET Centre, The University of Reading, UK.

*0–60 in (what seems like) seconds: A year of ePortfolios at the University of Wolverhampton – Shane Sutherland: University of Wolverhampton, UK.*

*Curriculum DeGóis – A Scientific ePortfolio – P. Sérgio Tenreiro de Magalhães, Leonel Duarte dos Santos & Luís Amaral, Universidade do Minho, Portugal.*
ASSESSING INNOVATIVE COMPETENCIES THROUGH LEARNING EPORTFOLIOS

By Lise Agerbæk, Associate Professor at Odense Technical College, Munkebjergvej 130, DK 5230 Odense M, +4563126806, ela@ots.dk, and Assistant Professor at University of Southern Denmark

Introduction
The last 4 years we have been assessing eportfolios at the education “Multimedia designer” at Odense Technical College. We have used the eportfolios as platform for the students to demonstrate a number of competencies, which were not being assessed in our traditional examinations: the ability to learn, be innovative, to be self-motivating, to self-manage etc. In this process we have reached a standstill.

The tools we have developed to assess the eportfolios (an assessment rubric1) has proven very useful in making the students not only demonstrate a certain level of activity, but also comment and reflect on their work in order to show how “mature” they are as students. It is our experience that a published and accessible assessment rubric influences the way the eportfolios are produced. It supplies the student with a guide for supplying the right content, and gives indication on how the student should reflect on his or her work.

But the tool2 we have developed has not been able to differentiate between qualified reflection and not-so-qualified reflection – what we have been able to assess if reflection is taking place at all. Also we haven’t been able to reward the students who used the tools of their trade (images, drawings, sounds, animations) to reflect on their work – and not only written words. We have lacked an assessment tool that would encourage the students to use the eportfolios as a tool for professional development.

The purpose of this paper is to describe our experience with assessing eportfolios as well as introducing a new assessment rubric, in which we focus on supporting the innovative competencies of the students.

Eportfolio presenting generic competencies
At Odense Technical College we have worked with eportfolios in relation to a “Short Cycle Non-University Higher Education” by the name of Multimedia Designer. The aim has been to give the students a platform to present themselves to their teachers, fellow students and future employers through a web-based e-portfolio. So far 334 students have presented themselves via an eportfolio. It is strictly a presentation3 portfolio. We choose a presentation eportfolio, because one of the general purposes of this education is to teach the students to present their work either to peers or to clients.

We introduced the e-portfolio as a means to solve a problem we encounter when our students graduate. Our students are hired more on the basis of their generic competencies, than on the basis of their more formal skills. The required formal skills in the field of multimedia develop differently than in other professional fields.

Here the methods and tools taught to students are threatening to become obsolete as soon as they are taught, due to the rapid development in the field of information technology. Even if a student receives very high grades for designing a website, or developing an application for mobile units, the tools and even the coding languages used will probably not be the adequate and state-of-the-art for more than the next 6 month. As

1 See appendix 1
2 You can find the Assessment rubric in the first version as appendix 1 of this paper.
3 Hence we choose not to use a “working eportfolio” where access is restricted to e.g. only the student and his or her teacher as the term is described by Roger Ellmin in “Portfoliomodellen”, 2001.
exactly that amount of time often passes before the student gets a job – he or she is hired not on what was learned at school, but on the ability to keep learning.

Multimedia designer is a “Short Circle Non-University Higher Education”. It gives the students a diploma level (120 ECTS) – which they can use to get a job in the field of information technology or as credit transfer to finish their bachelor levels at The University of Southern Denmark and Aalborg University. We teach the program both in English and Danish.

We ask each student to present themselves in a formalized e-portfolio website that is provided by the college. This website is public the way any website is, so it is immediately possible for any stakeholder to read what the student chooses to write. We do not protect access via login etc.

The goal obtained by having the e-portfolio be public is twofold: On the one hand the student demonstrates ability to express him- or herself to a target audience which might be as varied as it is for any other website on the internet. On the other hand the student demonstrates knowledge of own competencies through describing them in a structured way.

The structure of the eportfolio at OTC

The “filling out” of the eportfolio is done in a highly structured way described for the students in a students manual. The student fills out a front page with information of his or her background and educational objectives and goals. Every subject area of the program is described in a “profile” – and the different parts of each subject are described in a series of competencies. So each student has at least 4 profiles - and then one, because we ask them to look at themselves as learners in the “Learner” profile. Teachers point parts of their curriculum, and stipulates which competencies belong to each profile for each semester (normally 2-4). The students are welcome to add more than the stipulated number of profiles and competencies.

So each student has to follow a pre-structured way of describing themselves to their audiences – and they have to use the framework (an open source (ZOPE/PLONE content management system accessed via a browser) that is provided by the college. Even though it might be argued that this limits the students’ possibility to express them freely (and thus putting a limit to e.g. the generic competence of creativity and innovation), we choose to have a strict structure because

- it allows stakeholders inside and outside the college to compare the eportfolios, so that they may evaluate the students individually
- it enables us to more formally assess the eportfolios in relation to certain pre-described standards, in other words have an examination (I will return to this issue)
- it allows us to coach the students in a more clear and comparable way, if every student is submitting the same kind of material
- and last but not least we generally experience that the students are helped by having to develop their eportfolios in a very structured fashion. The steps are described in great detail which makes it easier to start the process of making your own ePortfolio.

Assessing the eportfolios at OTC

The purpose of assessment at the end of each semester is to find out if the student has met the objectives stipulated by the teachers in each of the four subjects, we teach. In this stage, the student will be in the position of getting an accreditation for reaching the curriculum objectives. The portfolio-related skills refer to the student’s ability to document (through dialogue, assignments

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1 Here is the homepage of the eportfolios at OTC http://www.multimediedesigner.ots.dk/20041213_080843
solving and explicit learning strategies, networking and reflections) that he or she has been active and constructive in designing his or her own learning plan.

At Multimedia Designer we choose to evaluate primarily the portfolio-related skills an internal evaluation end of the semester. The evaluation is done based on a series of criteria for evaluation – that is submitted early on in the semester to the students so that they may see what criteria they should meet. The evaluation is done in accordance with the before mentioned rubric – which makes it possible for the student and the teacher to rate the eportfolio using a number system.

**Making reflection happen**

The process of asking the student to describe attained knowledge and experiences in a very strict structure is intended to provoke reflection. We ask the student to describe what he or she does, why they do it and how it helps the student reach the goals we have asked him or her to describe on the front page of the ePortfolio.

This is the requirements that we have set for the content of the front page of the eportfolio:

| Front page | This is the place where the student explains his or her intentions with choosing Multimedia designer – and the goals he or she hopes to achieve by finishing this education. Also here a bit of information about the educational and cultural background. |

And this is what the assessment tool stipulates on how the front page is evaluated:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Exemplary</th>
<th>Proficient</th>
<th>Partially Proficient</th>
<th>Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>The goal(s) and Objective(s) for choosing the education on the front page of the ePortfolio</td>
<td>6 Points Goals and objectives are clearly and concisely written.</td>
<td>4 Points Goals and objectives are slightly ambiguous and/or too &quot;wordy.&quot;</td>
<td>2 Points Goals and objectives are available but are vague and unclear.</td>
<td>0 Points Goals and objectives are not included.</td>
</tr>
</tbody>
</table>

We assess 8 areas of the portfolio in this way. The numbers from all 8 areas are for each student added and the sum should surpass 20 points for the student to pass into the next semester. The student may achieve as much as 48 points. This numbering system allows us to grade the eportfolios using our normal grading scale. We simply turn the sum into a grade.

Having assessed and graded the first 6 classes of students we have - as mentioned above - reached a standstill. Our rubric does not allow us to differentiate between the student who has a “deep” level of or an innovative way of reflection, and the student who reflects superficially.

Here is an example. This is what is written on the front page of the eportfolio of one student:

*Hi my name is Farooh. I am from Uzbekistan, city Andijan. Before I have never been in abroad. Denmark is the first one. When I came here, I thought that it will be difficult for me to study and make

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5 See appendix 1
6 The Danish grading scale uses numbers and contains the grades 00, 03, 5, 6, 7, 8, 9, 10, 11, 13. You need a 6 to pass. The points of the eportfolios are turned into grades like this: A - Exemplary: 48 - 32 points = 13 to 9; B - Proficient: 31 - 20 points = 8 to 6; C - Partially Proficient or Incomplete, needs to be resubmitted: less than 20 points, 5 to 00.
7 [http://www.multimediedesigner.ots.dk/users/FAN](http://www.multimediedesigner.ots.dk/users/FAN)
friends, however, I was wrong. Here, teachers are very polite and have a deep knowledge on their subject. They helped me a lot. Thanks for them. So why I choose this field of study?? First, I have a great interest to Multimedie Design, secondly, this field of study is not developed in our country yet and it is not easy to find a specialist on this sphere. And main one is I see a great future of Multimedie Design, because it is the today's market demand.

I have many goals of studying here, but main one is to help our uzbek youth working on these programs and creating web pages. I have a goal opening MMD school in our city, Andijan. Besides, in the future this knowledge helps me to do a lot of good work with my business knowledge.

In here this student put into words his interest in the program – and his reason for choosing it. He is in other words showing the reader that he has a fixed goal for starting the education – and also a clear idea what he wants to use it for (in this case it even has national implications). He is in this way demonstrating his self-management competence, as well as his communicative competence.

Here, on the other hand, is what another student8 writes:

Why am I here?
Like many Icelanders before me Denmark was for me an excellent option for a place to study. The main reason for this is the difference in prices. Any one who’s been to Iceland can testify to the countries high prices in almost anything (blessed be our right wing government). Relevant to Iceland Denmark’s general prices are quite low regarding sustenance and other lives necessities. Cars however are more expensive so it’s not all one sided.

My goals
So what am I going to do with this education? The possibilities seem to be endless right know. Photoshop, programming, flash or gaming for example? I would like to be involved in something that’s creative. And there’s always the question of getting a degree. I’m definitely going to continue studying after this, unless a good job comes along the way.

He makes the whole process of moving to Denmark a question of money – and he is very vague about what he wants to use his education for. He is on the other hand still reflecting – in as much as he is discussing objectives and goals. He is wondering about his future and he has reasons for moving to Denmark – even though they seem less mature than in the first example.

Another problem derives from the fact that we have seemed to only reward the students who are “good with words”. The assessment rubric simply has no way of giving credit to the students who use the images, animation, drawings or sound to reflect on their work. We do demand that they show examples of the work – but we have no way of rewarding a student, who puts the extra effort into using images reflectively.

8 http://www.multimediedesigner.ots.dk/users/JVG
Here Simon is reflecting on the subject of Visualization\(^9\).

And here Sylvester is doing the same\(^{10}\).

Simon is more reflective in his use of words, whereas Sylvester uses a design technique to comment on his interpretation of the subject visualization. It emulates the lithographic technique developed by Andy Warhol during the 60ies. Sylvester takes the most famous painting in the world (as did Andy Warhol himself, actually) and uses the technique to point to the icon-status the image has today. Thus he visually “reflects”

\(^9\) [http://www.multimediedesigner.ots.dk/users/SPJA/portfolio/profiler/20051215_094431]
\(^{10}\) [http://www.multimediedesigner.ots.dk/users/SAH/portfolio/profiler/20060307_141225]
on the fact that the subject of visualization is about learning a craft (the technique) – but also about learning guidelines to create, evaluate and appreciate art. Or as Simon so aptly writes “Design is more than saying “This looks nice”.”

So they both reflect – but within our assessment tool only Simon’s reflections would receive an outstanding grade, because his reflections are written, not drawn. This does not make Simon’s work any less good – but we need to be able to assess also other ways of expression – for no other reason that we actually teach these! In other words, we would like to encourage the students to use the competencies and tools they learn at the education to develop themselves and their projects in inventive ways.

The Danish ministry of Education has embarked on a quest that has meaning in relation to this. So I will continue this paper by describing what has come to be known as “the innovation strategy” as an answer to the challenge a globalized world offer.

Developing innovative competencies

In 2005 the Danish Ministry of education launched a program seeking “to place education, innovation and entrepreneurial competencies at the heart of a strategy for bettering Denmark’s opportunities and challenges of globalization”.

The first step in this direction was to launch a “working group”, which looks upon what is needed in the Danish educational system to ensure that pupils and students receive teaching which enables them to be innovative and entrepreneurial in a rapidly developing global world. The terms of reference for this group are describes education as “an important piece in the government’s strategy because the cost for an entrepreneurial culture is poured in young people during their education.”

In January 2006 all the teachers from the Multimedia Designer program participated in a two day workshop, where we were introduced to interpretations of the term innovation – and where we tried out different methods of teaching innovatively – on each other actually.

The result of this workshop was that every teacher has looked closely at their subjects to find out whether or not the teaching content and methods reflect innovation, because we are presupposing that innovation cannot be taught by (only) using traditional teaching methods.

Looking closely at the eportfolios we realized that the students can and have used them for describing innovative projects and products – but that the assessment rubric has not supported innovative thinking and reflecting. So this is another reason for looking at the assessment rubric and finding ways in which it might actually prompt innovative competencies in our students, because we – as previously stated – have experienced that a published and accessible assessment rubric influences the way the eportfolios are made.

How to define innovation

In recent years a lot of research has been done in the field of innovation especially at CBS (Copenhagen Business School) in CIE (Centre for Innovation and Entrepreneurship) by Henrik Herlau among others. One of the former Ph.D. students of this school, Lotte Darse, has in her treatise suggested the “innovation diamond” model. This model contains the answer to the intrinsic question of how innovative processes can be initiated, supported and managed in organizations working with the creation of knowledge.

11 Translated by the author from http://pub.uvm.dk/2006/entrepreneur/index.html
12 Translated by the author from http://pub.uvm.dk/2006/entrepreneur/Kap01.html#1.1
13 Taught by Bo Krüger, http://www.movingminds.dk/
14 Described in the 2001 book “Innovation in the making” based on her Ph.D. treatise.
The model symbolizes a dynamic field of process in four dimensions: Knowledge, concepts, relation and non-knowledge. The four dimensions are not opposites - because they are present simultaneously.

Knowledge is based on facts and data, and this is an important part of the foundation of innovation.

Conceptualizing is about getting a clear vision of what you are developing. The process of conceptualizing should be started immediately, because it helps people who are working together to agree on, what they are actually talking about. It simply eliminates a lot of misunderstanding.

Relations between the participants are always formed, and it is very important that they are expressed, talked about and worked on from the very start. Also the ability of a group of persons to create, shape and sustain good relations plays a leading role when it comes to actually realizing projects.

Non-knowledge addresses the grey area of knowledge we do not possess yet. It deals with the knowledge we know, we don't have, but also the knowledge we didn't know we needed. In this area you find the basis for the very new - and you often find it by asking the really stupid questions. Here you also address the knowledge you didn't know you had - the so-called tacit knowledge.<sup>15</sup>

In our work with eportfolios the first stop to “the next generation eportfolios” is to try to incorporate the innovation diamond in our assessment rubric. This way we hope to ensure that the students are evaluated on their innovative competencies as well as on their level of activity and the level of self-consciousness as students (that is their maturity)

I will now go through the assessment rubric and show how and why it has been altered so that it incorporates terms described in the innovation diamond.

The new assessment rubric

The new rubric has to address all four areas of the innovation diamond; because it is in the collaboration between them innovation is born, so to speak. In the following I will give a detailed view on how and why we assess the four “corners” of the diamond.

Knowledge

To a large extent we have been assessing the level of knowledge the student possesses in the sense that we ask them to describe what the content of our four subjects are (in the profiles). Understanding knowledge in connection with the innovation diamond means to look for signs of knowledge being challenged – so that the student should question everything he or she knows, even the stuff that seems self-evident. So in assessing

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<sup>15</sup>This very crude explanation of the model is based on the description on page 8 in “NPK” by Lotte Darsø, Bo Krüger and Jørgen Rafn.
the use of knowledge we should look for the student’s ability to challenge knowledge, by looking beyond the given. Does he or she use strange sources? Does he or she question what they already know?

In the new rubric it looks like this:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Exemplary</th>
<th>Proficient</th>
<th>Partially Proficient</th>
<th>Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation – knowledge: Does the student question his or her knowledge, and the way it is obtained? Is the student aware of own prejudice?</td>
<td>6 Points</td>
<td>4 Points</td>
<td>2 Points</td>
<td>0 Points</td>
</tr>
<tr>
<td>The student describes experiences within the four subject areas that have challenged his or her own knowledge. She or he is explicit about the different ways he or she obtains knowledge.</td>
<td>The student is aware of his or her knowledge but not clear on how it is challenged. She or he describes at least one way of obtaining knowledge.</td>
<td>The student is only slightly aware of his or her knowledge and not clear on how it is challenged. She or he describes no ways of obtaining knowledge.</td>
<td>The student is not aware of his or her own knowledge and is not clear on how it is challenged. She or he doesn’t describe any ways of obtaining knowledge.</td>
<td></td>
</tr>
</tbody>
</table>

At lot of our students tend to repeat exactly what they have been told, when asked to describe a certain field of knowledge they have been introduced to. Here are three students reflecting on a tool they have been taught (The Star Analysis):

Andreas:

“The star analysis is a tool used in the early stages of web design. You analyze different problems and aspects related to the web design: the contemporary design trends, the user situation, the design tradition and other things.”16

Elva:

“We used STAR Analysis in both of our projects this semester. I really love to explore other websites to get ideas and how others use tradition and trend in their sites. It is helpful to use this analysis to get a better view of your own web design. It also brings you closer to your design when you do the mock-ups of the site you are creating.”17

John

“The Star Analysis is a tool to help you creating a visual identity. Personally I think most of this is basic knowledge, but it could be good to make it more structured and organized. In general it makes you compare it to other sites/products to see what is most commonly used. I don’t think this tool is very important as many of the answers are sometimes very obvious or easy to figure out (or maybe I have misunderstood how to use the tool).”18

Andreas is actually just repeating what he has been told. In reflecting on the tool John and Elva evaluate the tool in relation to the kind of knowledge that is obtainable with the tool. But John actually criticizes the tool, which he finds inadequate, and in doing so reflects on his own knowledge in relation to the subject that is taught. In the new assessment rubric this will be acknowledged.

Conceptualizing

Conceptualizing is about getting a clear vision of what you are developing. In relation to eportfolios this can be understood as demonstrating that you, as a student, have the ability to clearly state in words or otherwise illustrate what you are making, and what the purpose of it is. What we want the student to show – and later

16 http://www.multimediedesigner.ots.dk/users/ANP/portfolio/kompetencer/20060731_174826?profileId=20051215_101338
17 http://www.multimediedesigner.ots.dk/users/EHA/portfolio/kompetencer/20060730_205058?profileId=20060301_103051
be assessed by the teacher – is ability to express an idea in a clear, concise and precise way. The result of clarity in this field is invitational – group members and collaborators are apt to participate in the project, if they understand it.

In the new rubric it looks like this:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Exemplary</th>
<th>Proficient</th>
<th>Partially Proficient</th>
<th>Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation – conceptualizing: Are the ideas expressed in relation to projects clearly expressed? Is the way it is expressed inviting others to participate?</td>
<td>6 Points</td>
<td>4 Points</td>
<td>2 Points</td>
<td>0 Points</td>
</tr>
<tr>
<td>The student introduces the project ideas he or she have participated in clearly either through words or by visualization. In doing so he or she is invitational – addresses an explicit audience.</td>
<td>The student introduces the projects he or she has participated in vaguely. In doing so he or she is not addressing a specific audience.</td>
<td>The student mentions the projects he or she has participated in. In doing so he or she is not invitational.</td>
<td>The student does not mention the projects he or she has participated in – and hence is not invitational.</td>
<td></td>
</tr>
</tbody>
</table>

Our students tend to be vague about expressing ideas – and sometimes do so to exclude other people. This is clearly an area that would improve the portfolios, because the process of conceptualizing is a critical part not only of a good innovative process – but also of any kind of project. The power goes to the project idea which was conceptualized the clearest – even if it wasn’t the best idea.

The general pedagogical philosophy of the Multimedia program is project based work in groups. In projects during 1st, 2nd and 3rd semester we ask the students to come up with project ideas, and give them tools to conceptualize these, but we often see that it is hard for the students to understand and discuss each others ideas, because they are too vague or not visualized clearly enough.

Relations

The ability of a group of persons to create, shape and sustain good relations plays a leading role when it comes to actually realizing projects. And this is a major issue with the kind of group based project work that we throw our students into the moment they arrive. We address problems in group forming, and the occasional group break-up by making the group agree on and sign a group contract as well as a group goal paper. The students on the other hand tend to see this as something a little unnecessary – and they don’t use it, when they finally get into trouble. They simply look upon group issues as separate from project issues. These are personal, not professional. By adding a relations parameter to the assessment rubric we believe it will be easier for the students to understand group dynamics as a professional field of interest.

In the new rubric it looks like this:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Exemplary</th>
<th>Proficient</th>
<th>Partially Proficient</th>
<th>Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation – relations: Is the eportfolio addressing an explicit target group? Does it invite people to join in? Is it showing networks?</td>
<td>6 Points</td>
<td>4 Points</td>
<td>2 Points</td>
<td>0 Points</td>
</tr>
<tr>
<td>The student defines who he or she wants to talk to. The portfolios have non-evident possibilities for commenting. The portfolio shows explicit personal network through e.g. links to other websites.</td>
<td>The student only hints at who he or she wants to talk to. The portfolios have some possibilities for commenting. The portfolio shows more general network through e.g. links to other websites.</td>
<td>The student does not define who he or she wants to talk to. The portfolios have some possibilities for commenting. The portfolio shows some network.</td>
<td>The student does not define who he or she wants to talk to. The portfolios have no possibilities for commenting. The portfolio does not show network.</td>
<td></td>
</tr>
</tbody>
</table>
In describing the group process John writes in his portfolio:\(^9\):

“A group goal is a common goal for the entire group. Our goal during the semester case and the exam project was to finish what we planned within the deadline. We didn’t really have any more than this.”\(^20\)

He is not taking the process of defining the group goal very serious, and he nearly writes that this is a waste of time. The goal he does define is without content and fairly tautological, so he clearly does not think of the relations within the group as an intricate part of the groups work.

The new assessment rubric will hopefully help to explain to the students the importance not only of working in groups but also of making yourself available as a partner with other students or companies outside of school.

Non-knowledge

The concept of non-knowledge is easy to misunderstand. It is not the opposite of knowledge, but rather the trajectory of the quest for knowledge. Non-knowledge points to the areas where a group or a person has no knowledge yet – specifically the knowledge that is needed in relation to bringing a project to life. This can be an area where the student already knows that he or she lacks concrete knowledge, but more interestingly it can be an area where the student didn’t know she lacked knowledge before she embarked on her project. Non-knowledge is a term for the kind of knowledge which has yet to be expressed. In this sense it points to the tacit knowledge which can be found in habits, images etc.

In the new rubric it looks like this:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Exemplary</th>
<th>Proficient</th>
<th>Partially Proficient</th>
<th>Incomplete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation – non-knowledge:</td>
<td>6 Points</td>
<td>4 Points</td>
<td>2 Points</td>
<td>0 Points</td>
</tr>
<tr>
<td>Is the student expressing strategies for obtaining new knowledge?</td>
<td>The student explicitly expresses strategies for obtaining new knowledge e.g. through asking relations or researching imagery.</td>
<td>The student indicates strategies for obtaining new knowledge.</td>
<td>The student uses 1 non verbal way of expressing him- or herself.</td>
<td>The student indicates no strategies for obtaining knowledge.</td>
</tr>
<tr>
<td>Does the student express himself nonverbally?</td>
<td>The student uses different non verbal ways of expressing him- or herself.</td>
<td>The student only expresses himself in words.</td>
<td>The student only expresses himself in words.</td>
<td>The student only expresses himself in words.</td>
</tr>
</tbody>
</table>

This is harder than most areas to assess, but it is also clearly within this area that “the really new” is found. One of our Danish students, Daniel, took it upon himself to reinvent to user interface of the eportfolio content management system we provide. On the front page he creates a blue frame\(^21\) within which the portfolio is then placed. The top of the frame uses a pattern closely related to early computer games graphics – which is one of his deep interests. Also the letters used for headlines have a pixilated style that reflects his “nerdy” image.

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\(^9\) http://www.multimediedesigner.ots.dk/users/JWI/portfolio/kompetencer/20060729_204904?profil=20051215_100543
\(^20\) http://www.multimediedesigner.ots.dk/users/ANP/portfolio/kompetencer/20060729_204904?profil=20051215_100543
\(^21\) http://www.multimediedesigner.ots.dk/users/DIS
Daniel creates his own visual universe to let the user/reader know something more about him than what text could supply. In doing so he is touching upon a tacit knowledge, he hopes he shares with his user/reader. In this sense he is expressing non-knowledge (and also inviting relations).

Conclusion

The new assessment rubric has yet to put into use at Multimedia Designer, here in September 2006. We will use the next couple of month to introduce it to the new 1. Semester students. The first assessment according to it will take place in December 2006.

So it is still too early to actually know if we by choosing it will achieve more innovative initiatives and more experimenting among the students. But based on the experience of using the previous assessment rubric we are confident, that being explicit about the assessment criteria encourages the students to go where the assessment stipulates success.

The explicitity of the assessment criteria is also in a certain way a process of challenging the knowledge you have and an encouragement to look for more, because when students act on it – it immediately becomes clear what works and what doesn’t work. So in a sense what this process of developing assessment methods for the eportfolio has meant is a process of innovation among teachers and staff at the Multimedia Design program – as did the process of working with the portfolio in the first place.
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Appendix 1 – Old Assessment Rubric from Multimedia Designer Program, OTC, Denmark

**Multimediedesigner, First semester, Evaluation criteria**

**A - Exemplary:** 48 - 32 points

**B - Proficient:** 31 - 20 points

Partially Proficient or Incomplete - Need to be resubmitted: less than 20 points

<table>
<thead>
<tr>
<th>Aktivitet</th>
<th>Exemplary</th>
<th>Proficient</th>
<th>Partially Proficient</th>
<th>Incomplete</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal(s) and Objective(s) for choosing the education on the frontpage of the e-Portfolio</td>
<td>6 Points</td>
<td>4 Points</td>
<td>2 Points</td>
<td>0 Points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Goals and objectives are clearly and concisely written.</td>
<td>Goals and objectives are slightly ambiguous and/or too &quot;wordy.&quot;</td>
<td>Goals and objectives are available but are vague and unclear.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profiles: Business, Communication, Visualisation, Interaction development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of understanding the 4 different subject areas which constitutes the Multimediedesigner as expressed in the frontpage of each profile</td>
<td>6 points</td>
<td>4 points</td>
<td>2 points</td>
<td>0 points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clear acknowledgement of the division between the subject areas and description of student’s own level and progression in relation to each subject</td>
<td>Somewhat vague understanding of the division between the subject areas – expressed slightly ambiguous and/or too &quot;wordy.&quot;</td>
<td>The division is available but is expressed vaguely and unclearly. No expression of own level or progression.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attaching competencies to each profile</td>
<td>6 points</td>
<td>4 points</td>
<td>2 points</td>
<td>0 points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All profiles have attached competencies and the relation to the profile is clear</td>
<td>All profiles have attached competencies but the relation to the profile is ambiguous or too &quot;wordy.&quot;</td>
<td>Only some of the profiles have attached competencies – and the relation to the profile is vague or unclear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Documenting the competencies</td>
<td>6 points</td>
<td>4 points</td>
<td>2 points</td>
<td>0 points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>All competencies are documented with examples of work or certificates and the reason for their documentative nature is explained</td>
<td>All competencies are documented with examples of work or certificates, but their documentative nature is vague or not explained</td>
<td>Some competencies have been documented, but without explanation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profile: Learning process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall description of the learning process (projectwork, group work.)</td>
<td>6. points</td>
<td>4. points</td>
<td>2. points</td>
<td>0. points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Understanding of the processes and their impact on own learning are clearly</td>
<td>Understanding of the processes and their impact on own learning are</td>
<td>Understanding of the processes and their impact on own learning are</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence: Learning style</td>
<td>6 points</td>
<td>4 points</td>
<td>2 points</td>
<td>0 points</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
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<td>----------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>The portfolio documents that the concept of learning style has let to explicit learning strategies</td>
<td>The portfolio documents that the concept of learning style has had some impact on own learning initiatives</td>
<td>The portfolio documents that the concept of learning style is known but shows no impact in personal initiatives</td>
<td>The concept of learning style and its learning importance is not present.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competence: Team role</th>
<th>6 points</th>
<th>4 points</th>
<th>2 points</th>
<th>0 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>The concept of team role and its learning importance is clearly and concisely written.</td>
<td>The concept of team role and its learning importance is slightly ambiguous and/or too &quot;wordy.&quot;</td>
<td>The concept of team role and its learning importance is available but are vague and unclear.</td>
<td>The concept of team role and its learning importance is not present.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Documenting the competencies in profile Learning Process with test results and examples of group evaluation</th>
<th>6 points</th>
<th>4 points</th>
<th>2 points</th>
<th>0 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>All competencies are documented with test results and evaluation and their documentative nature is explained</td>
<td>All competencies are documented with test results and evaluation but their documentative nature is vague or not explained</td>
<td>Some competencies have been documented, but without explanation</td>
<td>No competencies have been documented</td>
<td></td>
</tr>
</tbody>
</table>
PLANNING AND IMPLEMENTING AN INSTITUTIONAL STUDENT DEVELOPMENT PROGRAMME IN PERSONAL DEVELOPMENT PLANNING AND EPORTFOLIOS

Barrie, Alyson, James Watt College of Further and Higher Education,
Boyle, Elizabeth, University of Paisley and Graham, Gerard, University of Paisley

Background

The ISLE Project is a collaboration of ten partners from Further Education and Higher Education institutions across Scotland. The project has the objective of supporting the individual learning process through Personal Development Planning (PDP) and ePortfolios. This is a work in progress paper and is focussed on the benefits of ISLE for students, in particular with student development needs.

Through identifying the benefits students derived from the PDP process it is hoped that the project can identify what approaches need to be taken to successfully engage students in PDP. Because of the range of partners involved in the pilot, the project will be able to gather data across a range of criteria. It is hoped the research will show if there are different approaches needed for different:

- subject / curriculum areas
- levels of study
- sectors
- age ranges.

The project will also gather data on the impact on student engagement of different support models provided in different institutions. The project will also assess the impact of assessment on student engagement.

Literature review

A review of research on PDP and ePortfolio use revealed a lack of work specifically focusing on the student development needs. The REFLECT initiative (Barrett, 2006) shows two key themes emerging around what is the purpose of portfolios?

1. Portfolios, and more especially electronic portfolios, can allow for non traditional assessment to be recorded and authenticated – giving a more holistic measure of student progress for a greater number of students than the ‘snap shot’ given by traditional test assessments. From the student perspective the ‘reflection’ section of the portfolio can make them much more aware of how, what and why they are learning thus enriching the learning experience.

2. Portfolios can also provide evidence for education establishments to show how students have progressed within their institution during their time spent with them – giving a more comprehensive picture of student progress than the traditional grade system. The portfolio provides evidence for the performance indicator (PI) of ‘distance travelled’ – a key PI for the FE sector and increasing numbers of non traditional entrants to the Higher Education sector.

For the ISLE project, where student development needs are paramount, it is important to distinguish between these two purposes, emphasising to the students what will bring them most benefit to in any given situation. Students should be made aware that “the real potential for ePortfolios is in the widening contexts in which learning is taking place – or is recognised to be taking place – and in the ability to bring together personal learning gained in multiple contexts” (Atwell, 2005).
Students require a compelling proposition that is not only understood by them but also more importantly by the staff supporting them. “An institution, or more specifically a course, really needs to identify the learning outcome of using the ePortfolio and ensure that the ePortfolio is aligned with the rest of the course. This goal then needs to be explained clearly to the students, and perhaps has to be better understood by faculty and support services. Students need to know why they are doing this and what is in it for them” (Tosh, 2005).

The ISLE project is uniquely placed to put this assertion to the test. ISLE will provide evidence of the experience of students with widely differing backgrounds on widely different levels of courses in a wide variety of curriculum areas.

**Summary of results to date**

The Phase 1 pilot ended in June 2006 and involved 137 students from a range of subject areas – computing, biomedical science, childcare and education, social sciences, graphic and media, theatrical costume design, engineering; and covered a range of levels of study – from SCQF level 5 to level 8. There was a range of ages and levels of computer literacy. Several ePortfolio systems were used.

For some students PDP was delivered as part of their course – sometimes, but not always, assessed. For some it was on a voluntary basis, carried out in their own time while for others the ePortfolio tool was introduced and used as part of their guidance and support time.

There are four sub groups operating within the project, each gathering data over a range of themes, four of which are common to the whole project:

- comparative study of FE/HE PDP experiences
- students in transition
- PDP across the curriculum
- resources to support PDP and Diagnostic Testing.

The following themes have specific significance to the development of a student development framework:

- ePortfolio systems – with regard to student development this theme is gathering information on the development and use of systems to support PDP and their impact on initial student engagement in the PDP process. In particular looking at the effects of subject, age, level of study to student preferences for particular ePortfolio tools
- Transferring student data – in particular how easily student data can be stored, merged or transferred from one system to another within an agreed common framework. The impact of this on student engagement will be evaluated.

In addition the project is evaluating the student experience by:

- mode of delivery – including whether voluntary of not
- resources used in support of PDP
- the ePortfolio tool used
- whether the participation is assessed or not
- level of support provided by the ePortfolio, staff and other students.

**Quantitative Data**

Quantitative data on demographics and attitudes to PDP and ePortfolios was gathered through pre and post pilot questionnaires. Analysis of pre and post participation responses by students reveal key indicators of student development needs. 174 students completed the pre questionnaire and 84 of this total completed the post questionnaire.

**Attitudes to PDP, ePortfolios and diagnostic testing**

Students were asked to respond to a series of positive and negative statements presented in random order by indicating their level of agreement to each statement. Tables 1 and 2 show
attitudes to PDP and ePortfolios before and after participation in ISLE. Non parametric tests comparing the positive attitudes scales for both PDP and ePortfolios before and after ISLE intervention showed that mean ratings on positive attitudes to ISLE were significantly lower for PDP and ePortfolios following participation in ISLE (PDP: Z (76)=−5.218, p<0.001, ePortfolio: Z(77)=−4.693, p<0.001).

Although there was no significant difference in the negative attitude scales to PDP and ePortfolios following participation in ISLE, one of the negative statements, ‘gets in the way of learning’ is significant. This correlates with the student comments during the focus groups that the timing of the pilot was wrong as students had too many other priorities competing for their time.

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Sd</th>
<th>Post</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>more effective learning</td>
<td>3.47</td>
<td>.78</td>
<td>2.98</td>
<td>.90</td>
</tr>
<tr>
<td>helps identify skills</td>
<td>3.64</td>
<td>.79</td>
<td>3.29</td>
<td>1.05</td>
</tr>
<tr>
<td>more responsibility</td>
<td>3.54</td>
<td>.79</td>
<td>3.07</td>
<td>1.01</td>
</tr>
<tr>
<td>helps identify goals</td>
<td>3.69</td>
<td>.75</td>
<td>2.94</td>
<td>1.08</td>
</tr>
<tr>
<td>make me more independent</td>
<td>3.44</td>
<td>.80</td>
<td>2.88</td>
<td>.98</td>
</tr>
<tr>
<td>will change way I learn</td>
<td>3.09</td>
<td>.72</td>
<td>2.69</td>
<td>.83</td>
</tr>
<tr>
<td>will help make me employable</td>
<td>3.61</td>
<td>.89</td>
<td>2.78</td>
<td>.96</td>
</tr>
<tr>
<td>will change way I interact with staff</td>
<td>3.03</td>
<td>.73</td>
<td>2.63</td>
<td>.86</td>
</tr>
<tr>
<td><strong>PDP positive scale</strong></td>
<td><strong>3.45</strong></td>
<td><strong>.57</strong></td>
<td><strong>2.83</strong></td>
<td><strong>.68</strong></td>
</tr>
<tr>
<td>waste of time</td>
<td>2.38</td>
<td>.85</td>
<td>2.59</td>
<td>1.02</td>
</tr>
<tr>
<td>difficult to learn</td>
<td>2.57</td>
<td>.78</td>
<td>2.60</td>
<td>1.07</td>
</tr>
<tr>
<td>gets in way of learning ***</td>
<td>2.67</td>
<td>.97</td>
<td>3.15</td>
<td>1.08</td>
</tr>
<tr>
<td><strong>PDP negative scale</strong></td>
<td><strong>2.52</strong></td>
<td><strong>.58</strong></td>
<td><strong>2.68</strong></td>
<td><strong>.86</strong></td>
</tr>
</tbody>
</table>

Table 1: Attitudes to PDP pre and post ISLE intervention.

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Sd</th>
<th>Post</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>ePortfolios</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>more effective learning</td>
<td>3.24</td>
<td>.70</td>
<td>2.96</td>
<td>.95</td>
</tr>
<tr>
<td>helps identify skills</td>
<td>3.51</td>
<td>.70</td>
<td>3.14</td>
<td>.98</td>
</tr>
<tr>
<td>more responsibility</td>
<td>3.33</td>
<td>.72</td>
<td>2.90</td>
<td>.88</td>
</tr>
<tr>
<td>helps identify goals</td>
<td>3.50</td>
<td>.72</td>
<td>2.93</td>
<td>.95</td>
</tr>
<tr>
<td>make me more independent</td>
<td>3.24</td>
<td>.68</td>
<td>2.82</td>
<td>.88</td>
</tr>
<tr>
<td>will change way I learn</td>
<td>3.06</td>
<td>.71</td>
<td>2.72</td>
<td>.86</td>
</tr>
<tr>
<td>will help make me employable</td>
<td>3.48</td>
<td>.79</td>
<td>2.77</td>
<td>.90</td>
</tr>
<tr>
<td>will change way I interact with staff</td>
<td>2.99</td>
<td>.71</td>
<td>2.50</td>
<td>.80</td>
</tr>
<tr>
<td><strong>ePortfolios positive scale</strong></td>
<td><strong>3.29</strong></td>
<td><strong>.54</strong></td>
<td><strong>2.83</strong></td>
<td><strong>.68</strong></td>
</tr>
<tr>
<td>waste of time</td>
<td>2.50</td>
<td>.77</td>
<td>2.59</td>
<td>1.01</td>
</tr>
<tr>
<td>difficult to learn</td>
<td>2.68</td>
<td>.67</td>
<td>2.55</td>
<td>.81</td>
</tr>
<tr>
<td>gets in way of learning ***</td>
<td>2.75</td>
<td>.85</td>
<td>3.04</td>
<td>.94</td>
</tr>
<tr>
<td><strong>ePortfolios negative scale</strong></td>
<td><strong>2.64</strong></td>
<td><strong>.59</strong></td>
<td><strong>2.71</strong></td>
<td><strong>.77</strong></td>
</tr>
</tbody>
</table>

Table 2: Attitudes to ePortfolios pre and post ISLE intervention.

Students confirmed that they had significantly more experience of PDP and ePortfolios after participating in the ISLE project. This experience gave them more confidence in explaining what PDP is, although it did not lead to greater confidence in explaining ePortfolios.
**Qualitative Data analysis**

Qualitative data was gathered from student focus groups around the partners. Sixty-seven students from eight of the partners covering ten different cohorts participated in focus groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of students</th>
<th>ePortfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>HND Computing 2nd Year</td>
<td>5</td>
<td>OSP</td>
</tr>
<tr>
<td>Computing 2nd Year Degree</td>
<td>3</td>
<td>OSP</td>
</tr>
<tr>
<td>Electronics 1st Year Degree</td>
<td>1</td>
<td>OSP</td>
</tr>
<tr>
<td>HNC Child Care and Education</td>
<td>5</td>
<td>BlackBoard</td>
</tr>
<tr>
<td>BA Cinema/Media 1st Year</td>
<td>3</td>
<td>BlackBoard</td>
</tr>
<tr>
<td>HNC Computing</td>
<td>7</td>
<td>BlackBoard</td>
</tr>
<tr>
<td>HNC Multimedia</td>
<td>2</td>
<td>SELF</td>
</tr>
<tr>
<td>HNC Social Science</td>
<td>13</td>
<td>SELF</td>
</tr>
<tr>
<td>SGA Computing</td>
<td>20</td>
<td>In-house PDP system</td>
</tr>
<tr>
<td>Theatre Costume Design 1st Year</td>
<td>8</td>
<td>PebblePAD</td>
</tr>
</tbody>
</table>

Table 3: Breakdown of students participating in Focus Groups.

Data was gathered and analysed to identify key factors in engaging students in PDP and the use of ePortfolios to support learning.

Four different ePortfolio systems were used by the students. In each of the question areas analysis was carried out to see if there were subject specific, age specific, level of study specific or sector specific factors emerging. Anecdotal evidence is emerging to indicate there are age and curriculum specific differences in attitude but it is too early in the project to say how significant they are. Phase 2 focus groups will explore this in more detail.

<table>
<thead>
<tr>
<th>Focus Questions</th>
<th>Summary of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often did you access your portfolio and where?</td>
<td>Contrary to belief at the start of the project the level of access to PCs was not seen as an issue overall. Little motivation was shown by students to access the systems outwith class time. In the majority of cases students could access PCs outwith class time either at home or elsewhere in the institution.</td>
</tr>
<tr>
<td>What did you use your portfolio for?</td>
<td>There is no evidence yet of widespread ‘buy in’ by students to PDP as a process. Most student groups needed prompting to come up with other uses e.g. UCAS personal statements, work experience logs, academic planning etc. Most student groups felt that they had insufficient time to use the system to be aware of alternative uses. There was a very strong indication from students that starting the pilot in the middle of an academic session was too late to be of any benefit. They had so many other commitments they were unable to devote enough time to a new system. Only those who were able to incorporate the use of the ePortfolio with their course work showed any real commitment.</td>
</tr>
<tr>
<td>How were you encouraged to use your portfolio?</td>
<td>In Phase 1, two groups were assessed; for another two groups it was part of their course work and the majority (six groups) were not assessed. There have been various research papers on assessment of portfolios and its impact on student motivation and engagement. The results to date from the ISLE project are inconclusive as to the direction of the impact assessment has on student motivation. A key objective of the ISLE project is to engage students in a process of reflective learning and personal development. Assessment for learning (Assessment Reform Group, 2002) is a part of that process but it is not the only factor. To single out one factor is to deny the importance of others contributing to the development of reflective learners. What is emerging as key in the research in this area is to be aware that different triggers are required to motivate students to engage with the PDP process – use of assessment is only one.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Who encouraged you to use?</td>
<td>In most cases only the tutor involved in PDP with the group encouraged the students to use their portfolio, some only at the initial induction stage. None of the other tutors delivering on the courses were involved. For many students lack of time; late start and other overwhelming priorities were key factors in their lack of motivation and some students indicated that even with more tutors encouraging them to use their portfolio they would not be more motivated.</td>
</tr>
<tr>
<td>What did you find were the major barriers to using the portfolio?</td>
<td>The key barriers given by students included a lack of time to work with the portfolio. This was cited by most groups. Another was it was the wrong time to introduce something new and therefore PDP/ePortfolio use was competing with many more important student priorities. Two groups in particular felt the software was limited, being too rigid and inflexible. Another group felt that a lack of reasons to use the tool meant they did not access as often as were asked. Some groups felt the portfolio was not customised to the needs of the subject group, age group or sector.</td>
</tr>
<tr>
<td>Do you plan to continue using it?</td>
<td>The majority of students did say they would use their portfolio again – in the next year of their study (or because they have been told they will be using it). Some students said No for various reasons including they didn’t like the portfolio used and they didn’t like the use the portfolio was being put to. They would respond better to a career and employability focus if it was introduced at the right time of year. Some students felt the whole PDP idea was more suited to school pupils in their 3rd year when they are making career choices. Some students felt that when they reached FE/HE they had already made their career choices. Some students indicated that more specific goals to aim for would help focus their minds on PDP, while others couldn’t see a use for ePortfolios in their course at all.</td>
</tr>
<tr>
<td>In what ways have you found your portfolio useful/helpful?</td>
<td>Some of the students commented if they had more pressure placed upon them they would have used their portfolio more. At different stages of study students indicated they would focus on different aspects of PDP. They felt the portfolio was good for seeing how much they had learnt and how far they had progressed. Some students would like to be able to create their own structure in the ePortfolio using HTML editing skills. Some students felt the tool they used was more of a self analysis tool than an ePortfolio according to the model used in the project. Some students found the ePortfolio not very useful/helpful, in particular they felt it was too repetitive and long winded. Some students indicated that at the start of the pilot they struggled to find reasons to use the portfolio but after consistent use they can see real benefits. One group felt it was too early in their learning process to comment on the usefulness of the portfolio. Some students indicated that they could see the effect of using a portfolio on employability and its effect on personal approach to learning.</td>
</tr>
<tr>
<td>What would you tell your friends about the portfolio?</td>
<td>Of the nine groups only four said they would recommend PDP and ePortfolio use to a friend. For others the reasons given for not recommending to a friend were related to the particular system used and their experience of using it.</td>
</tr>
</tbody>
</table>
Key points from the analysis

Three out of the four tools used in the project were piloted with Computing students. Many partners believing that the lure of a new system would be sufficient to prolong the engagement of the students.

For two of the OSP groups the work with the portfolio was integrated with their course work. The Computing degree students using it for work experience logs and the Electronics students as part of an optional unit on their course. The Child Care and Education students using BlackBoard were assessed on their portfolio work. Positive comments about the ePortfolios systems used were given by both computing and non-computing students.

Phase 1 covered a short time scale at a very busy time for students who had other priorities to meet and very little time to devote to learning new technology. They had expectations that using the ePortfolio system for PDP purposes would bring them benefits for little extra effort. For those students where the experience did not deliver this, their negative attitudes became more pronounced as evidenced in the negative attitude scores in the quantitative analysis.

Students from certain curriculum areas were looking for flexibility in the chosen tool that they could work with and customise as their confidence in its use grew. Tosh (2005) highlights the need for ePortfolio systems to be “adapted and re-shaped as the student gains skills and confidence.” Different curriculum areas and students individual learning preferences may necessitate contextualised approaches from the one institutional system.

Transferring student data

In the early stages of the project this has not been a priority. However in Phase 2 where more students are participating and some students from Phase 1 are progressing to further study in other partner institutions evidence will be gathered as to how data is transferred and if this is successful.

Conclusions

In preparing for Phase 2 of the project a number of lessons from Phase 1 can be learned.

The question of whether assessment has a long term effect on student motivation to engage with the process of PDP will be investigated to determine the level of influence on initial student motivation. Student feedback indicated that having a specific purpose for using the ePortfolio would make them more motivated in their use of PDP and ePortfolios.

The timing of when PDP/ePortfolio is introduced is important from a student commitment point of view and also from their ability to use the system effectively after the initial training. Phase 1 activities did not start at the most logical time for staff or students. It is hoped that the more suitable start time of a new academic year will obviate these concerns.

The importance of an informative and tailored induction clearly giving the rationale for PDP/ePortfolios was of benefit to student where it took place. All partners are being encouraged to include such sessions tailored to subject groups, age groups and course level.

The technology used needs to be appropriate, working properly and available for students to access. In many cases students did not feel confident in both what they were being asked to undertake, i.e. the process, and the systems there to support them, i.e. the ePortfolio systems, due to their unfamiliarity to the staff. With Phase 1 experience it is hoped that the technology will not get in the way of the process.

Where possible whole course teams will be involved in the project to ensure students get reinforcement on when to use and what they can be used for to precipitate the buy-in process for students.

Positive responses were noted from students where the ePortfolio tool is part of the on line systems used by staff/students for other aspects of the course. It is hoped that the ePortfolio systems will be further embedded as supporting tools for learning and teaching.
A holistic approach to student development also needs to be tailored to individual curriculum/student needs and therefore the adoption of a flexible and dynamic approach is advocated. Positive responses were gathered from the majority of groups with regard to peer support/mentoring at the induction stage. Most students felt it would have helped their understanding/motivation to have had input from students already using the system. Although the majority of Phase 1 students did not feel confident enough themselves to act as mentors for Phase 2 students it is hoped that some willing volunteers can be found. The PDP process needs to be more appropriately contextualised for the level of study, the type of student as well as for subject differences.

References

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E-PORTFOLIO IN THE REGULAR UNIVERSITY CHEMISTRY PROGRAMME

Natasa Brouwer and Wolter Kaper

Universiteit van Amsterdam, AMSTEL Institute, The Netherlands

Introduction

To become a competent independent and effective lifelong learner in chemical sciences, academic knowledge and successfully developed different academic general and research skills are necessary. A competence is an integration of knowledge, skills and attitudes. That is why the most natural way to learn skills efficiently is in a context of a specific discipline. An important part of a successful development of a competence is regular reflection on it. To improve skills to identify areas that require development, to set goals and make plans to achieve them, attention should be paid during the study. For example to do this a skill record can be used by students.¹

In 2003 the 5 year Chemistry study at the University of Amsterdam in The Netherlands changed to 3 + 2 year Bachelor – Master structure. This formal change was accompanied by an educational objective: to shift the teaching approach from more teacher-centred to more student-centred and the learning system to more competence based system. A pilot project General and Research Skills in the Bachelor took place from 2003 to 2006 to carry out this educational change.

The goal of this project was to give more attention to the development of academic skills during the curriculum and to get the students more involved with their own academic development. An electronic portfolio was used as a tool to support this.

The Integrated Competence Line in the Chemistry Curriculum

In order to realize the shift to more competence based learning, an integrated competence line was designed for the Chemistry curriculum. This means that in several compulsory courses explicit attention was paid to development of one or more general or discipline specific academic skills. The students used an e-portfolio to record their development in different courses and to reflect on this process once a year. To get feedback they did self evaluation, presented the evidence material and did reflection assignments in their e-portfolio.

(scheme 1).

Scheme 1: Integrated skills learning line
First the academic general and research skills relevant for academic chemists were defined. Several compulsory courses in each year of the Chemistry curriculum were chosen in which the development of academic competences got special attention. The development of each academic skill proceeded in more levels; for most skills three levels were defined. Interactive and activating teaching methods were applied in the chosen courses. The course assessment procedure was tuned with the teaching approach. This means that there was no classical theory exam, or a traditional written examination was only a part of the total assessment. Within the courses the feedback on the development of the student’s academic skill was given by the teacher. A written feedback in a specific form developed for each academic skill was given to each student usually accompanied by an oral feedback as well.

At the beginning of his or her study each student received a blank electronic portfolio and a reflection sheet, a check list of skills to evaluate his or her level and a few reflection assignments to do in each reflection moment. An explanation about the benefits of recording one’s own development in order to support it and to improve decision-making was given to the students. The students attended one hour long hands-on workshop how to use an electronic portfolio. At the end of the first semester the first reflection moment took place about the university study. Later in the bachelor there was a reflection moment each year in June. The feedback on ePortfolio’s was given by the coach. For attending reflection moments and do the assignments students got in total 6 EC credit points (Scheme 2).

**Scheme 2: Five reflection moments with feedback during the study**

For each reflection moment the student made a portfolio presentation, sent the coach an invitation to his or her ePortfolio and asked him/her for feedback on the reflection moment. Each portfolio presentation had a standard structure:
- a short presentation of the student (who am I?, why am I here?),
- a list of assignments / projects which the student produced in the period on which he or she reflects in the portfolio,
- the products on the list mentioned above,
- a reflection on his or her own development during the reflection period. To do this the student used the reflection sheet. This included a self assessment check list and a reflection assignment. The student kept this reflection sheet in his or her ePortfolio through the whole period of bachelor study in order to look back on his previous self assessments and reflections.
- a personal development plan (only as a part of the last reflection moment in the third year).
**Results and Discussion**

The project General and Research Skills in the Bachelor took three years. The development of the students was followed through their whole bachelor study by one coach. In the first semester all the first year chemistry bachelor students were obliged to work with the e-portfolio and to attend the reflection moment at the end of the first semester. The rest of the reflection moments were optional. All the bachelor students followed for the rest the same programme and had the same treatment by the teachers of the bachelor courses. The students who did not take part on the reflection moments had to apply for a paper portfolio assessment at the end of the bachelor study.

From the group of 23 students that started their bachelor in 2003, 9 students followed all the reflection moments in the bachelor regularly. 3 students followed only one of the three non obligatory reflection moments. 8 Students who started the bachelor in 2003 did not follow any activities at all. The most of them stoped after a while. Three students follow one of the non-obligatory reflection moments.

In June 2006 the first bachelor students who started in 2003 are finishing their bachelor research projects and will receive their bachelor degree on 18th of October 2006.

From the 23 students that started in 2003, 10 chemistry students have finished their bachelor in three years. All except two of these students used their e-portfolio and attended all of the reflection moments.

A survey was carried out after the first semester obligatory reflection moment and at the end of the bachelor. During the bachelor oral evaluation in response groups are carried out to evaluate the whole programme. The most students were not very enthusiastic about the activities in e-portfolio. Some of them were even very negative about it.

An anonymous survey at the end of the bachelor was given only to the students who will finish the bachelor within 3 years. 8 Students responded to the survey. All of them were positive about the approach that the development of academic skills is integrated within the subject specific courses. Only two of them would appreciate more extra lessons in academic skills. One student was very positive about the activities within this project and would not like to miss it in his or her study. He or she found it that the reflection activities helped to study more efficiently, to identify gaps and to develop better. One student was neutral; the rest of the students who answered the survey found that these activities did not influence the efficiency of their study or their competence development at all. All of the students appreciated the feedback given by the coach. Most of the students appreciated to work with an e-portfolio and none of them found it difficult.

The coach who followed the students was positive about the development of students. Comparing their reflection moments it was good to see how their academic competences were growing during the bachelor. The e-portfolio’s that the students made were a comprehensive archive of the assignments in the chemistry curriculum where academic general and research skills important for chemical science had to be applied.

The coach found that most of the students did their reflection moments seriously. Most of the students made their presentation in portfolio every time more attractive. In every reflection moment they argued their self assessment and made plans to improve their skills. In the next reflection moment usually an improvement was achieved and was visible in their assignments.

**References**

1. UNDERGRADUATE SKILLS RECORD (ROYAL SOCIETY OF CHEMISTRY),

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COMPETENCY-BASED ASSESSMENT AT NEW CENTURY COLLEGE: TOWARDS REFLECTION WITHIN THE RESPONSIVE LEARNING ORGANIZATION

Darren Cambridge  George Mason University

Higher Education Institutions as Models for the Responsive Learning Organization

Higher education increasingly encourages reflective learning as a path towards living a full, integral life and being able to continue to learn in a rapidly-changing workplace that demands flexibility and adaptation. However, as authors such as Richard Sennett suggest, this increased call for mobility and flexibility erodes the commitment employers once had to their workers and frustrates the desire for mastery, making it difficult to craft coherent, long-term life narratives (1). Thus, the humanist goal of self-actualization through lifelong learning and the expectation of lifelong learning in the contemporary workplace may come into conflict, despite a significant body of writing in management and education that attempts to see them as one and the same (2). The discourse of the “learning organization” may show how individual reflective learning supports organizational success, but it rarely insists upon organizational success being defined in a way that takes into the account the values and objectives of workers. The equation of individual lifelong learning with ongoing organizational development usually only solves in one direction.

However, escape is not an option. Human identity forms in relationship to institutions, and power flows through them. Even in a highly networked world, lifelong learners are unlikely to meet their goals and to develop in ways that enable them to be productive members of society—as defined from either an individual or institutional standpoint—unless they develop strong, long-term relationships with businesses, governments, and other institutions. Rather than avoiding dependence on institutions, our goal should be fostering interdependence of individuals and institutions, each shaping the other over time in a manner that balances their interests without glossing over their differences.

Institutions of higher education can serve as models for this more ethical relationship between individual learners and learning organizations. Universities should give students the experience of learning reflectively where they are both shaped by the educational community of which they are a part and have genuine agency to change the way that community works. With this background, students will be prepared both to succeed in a workplace that requires them to be flexible and to expect and demand that employers continuously hold themselves accountable for promoting their employees’ interests. If we want an ethical workplace for knowledge workers, we have to give students a voice in charting the course of the University.

Doing so requires a means for capturing and connecting both individual and organizational values and performance. In a higher education context, this means documenting what students think is important and the evidence they have to support these beliefs, putting these voices into conversation with those of other stakeholders, such as faculty and alumni. By so doing the organization discovers what it believes, as reflected in its actual practice of teaching and learning. This understanding can then be used to better align how the institution functions with what it values. At the same time, in order to avoid suppressing difference, space also is needed for individual identities to be represented in a form differentiated from the collective that expresses the integrity of individual life stories.
A New Role for Competency-based Assessment

Competency-based assessment can be this means, can be a process that makes this balanced relationship a reality. However, it requires rethinking some assumptions commonly associated with the use of competencies in higher education, particularly in relationship with portfolios.

First, competency-based assessment can no longer be simply a matter of measuring how well students’ learning matches a set of pre-defined, measurable standards of performance. Rather, it must be focused on capturing a picture of the standards all stakeholders value as enacted in practice and analyzing how not only student learning but also the curricular and programmatic structure of the University align with these values.

Second, competencies need to be seen not simply as a means for articulating the institution’s expectations to students, but more centrally as a means for connecting individual reflection with organizational learning where each is accountable to the other. Competencies should function as what Susan Leigh Star has termed boundary objects, conceptual technologies that join local and global actions together, providing the opportunity to be very specific at the local level while maintaining a sense of collective coherence when multiple local activities are woven together (3). Competencies serve as a shared framework that enable students to tell their highly-individual stories while enabling the larger learning community within the institution to put these stories into conversation and to collectively reflect on what it values and how well it’s doing.

Finally, competencies must be used within the context of what I term a reflective philosophy of assessment (4). Peter Gray identifies two primary philosophical approaches to assessment in the history of US higher education (5). The objectivist and utilitarian perspective argues that educational outcomes can be precisely described before the fact in terms of observable behaviors that can be measured in a manner independent of who is doing the measuring. The subjectivist and intuitionist perspective, in contrast, holds that learning is more complex and situated. The value of outcomes cannot be determined until learning has occurred and must be judged through the expertise of professional authorities. Gray notes that, while the former may be attacked as reductive, the latter is open to charges of elitism because it restricts conversation about what counts of genuine and valuable to an exclusive class and experts and institutional leaders.

The reflective philosophy shares with the later of these two traditions an investment in the situated judgments of those most directly involved with teaching and learning. However, it avoids elitism by valuing the reflective analyses of individual learners alongside those of those who have traditionally had exclusive control over judgment. In the words of Kathleen Yancey, from the perspective of reflective assessment, students are authoritative informants about their own learning (6).

Competencies, in reflective assessment, can provide a common language that helps connect the critical inquires about learning of all members of the learning community. They serve as a heuristic for framing individual knowledge about learning in a form that can connect to the larger community conversation and affect institutional change.

Reflective Assessment with Portfolios at New Century College

At New Century College (NCC) of George Mason University, this philosophy of reflective assessment underlies the use of ePortfolios throughout the curriculum. Portfolios serve both as an opportunity for students to tell their individual stories, taking ownership of their learning, and as a bridge connecting inquiry into individual and organizational practice. NCC’s nine competencies serve as a shared conceptual framework that enables this connection. Student portfolios become an important part of a community
conversation about what it means to be an educated person in the twenty-first century, and this conversation shapes the way programmatic and curricular decisions are made in the work of the College.

Students in NCC compose portfolios in multiple iterations over the course of their undergraduate careers. In the first year program, students compose portfolios for each of the four quarter-long intensive learning communities that make up the first-year program—Community of Learners, The Natural World, The Social World, and Self as Citizen—culminating in an ePortfolio that chronicles their learning experiences, both within and beyond the classroom, throughout the year. In most other courses students take at NCC, especially in team-taught, upper-division learning communities, they are asked to develop a portfolio that represents their learning during the course. In their final year, drawing on their portfolio work throughout their time at Mason, students compose an extensive graduation portfolio (7). Students complete this final iteration of their portfolio in the collaborative context of a senior capstone course, sharing their evidence-based understanding of the meaning of their learning with other students and the larger community.

Each of the portfolios students create generally share a common structure. Students are asked to organize their interpretations and evidence of their learning and performance in relationship to several of the nine NCC competencies: communication, critical thinking, strategic problem solving, valuing, group interaction, global understanding, effective citizenship, aesthetic awareness, and information technology (8). In the final first-year and graduation portfolios, this takes the form of a series of short essays linked to diverse artifacts that capture learning activities. In addition to analyzing their learning in terms of competencies, students present an integrative picture of their learning that synthesizes the competencies and contextualizes them within the students’ own stories of themselves as learners. In the first-year and graduation portfolios, this integrative process is realized through one or more integrative essays that draw both on the competency material and additional evidence of the students’ own definition.

Unlike in other curricula organized around sets of competencies, the graduation portfolio is not intended to measure whether the student has met a pre-defined set of minimum standards of performance in relationship to each. There is, for example, no pre-defined description of what a candidate for graduation must show they are able to do to be considered a competent critical thinker. Through their courses and in experiential learning experiences such as service learning and internships, students are exposed to a variety of different ways of understanding and evaluating each of the competencies. The curriculum embraces disciplinary and professional differences, with the conviction that competencies like aesthetic awareness may be conceived quite differently across a range of specific contexts, such examining a linear algebra proof, planning a fundraiser for an NGO, or describing changes to the countryside in the wake of urban sprawl.

In the final first-year and graduation portfolios, students synthesize these varied perspectives on the competencies. Early in their treatment of each competency, students are asked not to show how they conform to the official NCC definition (which is brief and broad) but to redefine the competency for themselves, showing how their definition is appropriate to their own unique experiences and goals. They combine insights from the perspectives they’ve explored through course work, experiential, and informal learning over the course of their educational experience to show how their reflections and evidence of learning add up. Through this process of redefinition, students take ownership of the competency. Rather than simply internalizing NCC’s standards, they leave us with their own. These individualized competencies prove far more useful to graduates than any generalized set NCC could hope to develop.

Perhaps even more importantly, they demonstrate the ability to learn intentionally, integrating strategies and objectives from a wide range of sources independently to make smart choices about learning in new environments, while still remaining true to their own long-term goals and commitments. Indeed, the primary outcome the portfolios measure is not the ability, say, to think critically or be an effective citizen—although the portfolios provide rich and convincing evidence of these things—but the ability to learn. As Meeus, Petegem, and Looy argue, these learning competencies may in fact be the outcome of higher education portfolios are most powerfully able to capture (9).
Throughout the curriculum, as well as in the culminating portfolio experiences, NCC asks students to continuously examine and develop their knowledge, skills, strategies, and values as they encounter new sources of information and function in diverse and rapidly changing environments. In order to live up to its promise as an ethical learning organization, NCC must not only ask students to engage in reflective practice but must also do so itself. Furthermore, putting the reflective philosophy of assessment into practice, this collective reflection must incorporate and value the evidence of learning and perspectives about what is valuable about a University education that students develop through their individual inquiries.

As boundary objects, the competencies connect the individual perspective, as represented in portfolios, with a community conversation about what it means to be an educated person. The competencies are left open enough to support the specificity of local practices needed to account for complexity of individual student experience and professional and disciplinary difference while provide enough common structure to enable these perspectives to be mutually intelligible, compared, put into dialog, and integrated. Shared understanding of the competencies and NCC’s effectiveness in helping students develop towards them is built through discussions in the capstone course taken by all students, brown-bag lunches open to all members of the community, and more formal examinations of specific competencies on reading days and at retreats. Student portfolios serve as the shared texts for discussions of the competencies, and students are invited to participate directly in all of these settings. The results of these conversations are highly valued by the NCC leadership and are primary drivers of changes to NCC’s curriculum and programs.

**Responsive, reflective assessment through the digital, networked medium**

Portfolios were part of the founding vision of New Century College, prior to the widespread popularity of electronic portfolios, and NCC’s long experience with them undoubtedly contributes to its success in integrating independent, individual reflective learning within a learning organizational structure that is responsive to student values and experiences. While student portfolios now mostly take electronic form, what has been described so far could apply equally well to both print and electronic portfolios. As NCC continues to build on its tradition, it is taking more extensive advantage of the distinctive affordances of digital and networked media for achieving its goals. This paper concludes by briefly describing two examples of this utilization, the first focused on individual integrative reflection and the second on bringing the community conversation online.

**Contextualizing competencies through concept maps**

In NCLC 249, a mid-level class about doing research on how people use the Internet, instead of the traditional integrative essay students compose concept maps as the integrative interfaces to their portfolios. Student choose at least three of the NCC competencies, three of the more specific goals of the course goals, and a parallel number of key concepts they found particularly powerful in their individual experience of the course. In their concept maps, they create visual representations of how these concepts and competencies combine, linked with examples of their work from the course, both formal and informal, to form holistic representations of their learning over the course of the semester. This approach is especially appropriate for the newest generation of university students, many of whom are highly visual learners (10).

In addition to the overarching visual structure, students annotated the short descriptions of each link with a reflective paragraph providing a more detailed analysis of the relationship between the two components of the portfolio. (See Figure 1.) When the reader of the portfolio rolls the cursor over the label, the annotation pops up, provided both the global, integrated visual representation and the rich textual analysis simultaneously. This effect would be impossible to duplicate in print.
Rather than spending their time trying to represent their learning within the confines of a traditional expository essay, students concentrate on reflective writing focused on the relationships between the items within the portfolio that synthesize them into a whole greater than the sum of the parts. This process of relationship building in central to integrative practice (11). The relationships themselves, not simply the collected evidence or the activity of reflection, is what makes a portfolio a portfolio (12, 13).

The presence of the NCC competencies within this highly individualized, student-owned picture of learning enables it to connect to the competency-driven community conversation about what matters in higher education. However, the competencies themselves do not significantly constrain the ways in which students may choose to tell their individual stories. Concept maps are also being used as alternate methods of integration in the capstone course and may be included in graduation portfolios.

![Figure 1: Screen shot of a concept map portfolio for NCLC 249](image)

**Using portfolios to capture capstone conversations**

The senior capstone course is also a key site for collective reflection on the competencies. Over a six week period, while composing and sharing the competency sections of their portfolios, groups of capstone students facilitate panel discussions about each of the nine competencies. Each panel includes current students, NCC faculty members, NCC alumni, and guests from around the University and local community, such as the director of institutional assessment or the chief information officer of a local technology firm. Students previous reflections on the competencies and evidence they have collected to include in their graduation portfolios help guide the discussions, along with a set of shared texts and students’ research. Students document the conversations with through recording audio and/or video and produce a multimedia synthesis of the discussion that captures both emergent consensus and distinctive perspectives.

While in the past this integrative work was largely confined within the context of capstone, this year it is being made more widely accessible through a collaborative Capstone Conversations portfolio (14). The conversation results are linked to selections from graduation portfolios focused on each competency, making the collective process of reflection more visible and accessible to the larger NCC community.

The Capstone Conversations portfolio is a first step towards using networked spaces to facilitate organizational reflective learning. In future iterations of the capstone experience, NCC plans to conduct the capstone conversations in virtual environments, using newly available Web conferencing software, and to build more powerful mechanisms for dialog and feedback within the portfolio space itself. By
continuing its tradition of innovative portfolio practice while tapping the power of digital and networked communication technologies, New Century College models the responsive relationship between reflective learners and learning organizations we hope our students help enact in the larger world.

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TOWARDS MEDIA, SKILLS AND PORTFOLIO BASED LEARNING CONTENT PERSONALIZATION FOR EUROPE’S GLOBAL EDUCATIONAL CHALLENGES

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KEYWORDS
Personal Learning, Skills & Competency based Education, Location Based, Context Aware, Mobile Learning, Learning Content Management System, LCMS, ePortfolio Management Systems

ABSTRACT
This paper is authored by Fabrizio Cardinali, the CEO of Europe’s leading provider of Mobile and Learning Content Management Solutions, Giunti Interactive Labs (www.giuntilabs.com).

The paper introduces new generation Learning Content Management Services and Solutions for rapid and massive content production for Skills based Learning and Mobile Learning, two possible solutions for the demographic and upskilling drifts having an effect on World Economies. Rapid changes are needed in the professional and vocational training methods and tools for global corporations entering the new Millennium.

INTRODUCTION
The global labor market is facing clear trends that will dramatically change professional training and development and the way we will use eLearning technologies to better cope with such changes in the next decade.

Leading economies, such as the US, Europe and Japan, are clearly shrinking in population whilst emerging economies such as India and China, are recording skyrocketing positions in the global labor market.

More than 1 Billion workers from emerging economies have joined the international labor market since 2000. At the same time Ford Motors expects that the number of employees older than 50 will double in Europe by 2008.

The demographic drift, a clearly recognized pattern in today’s world labor market, hides a slower but even more relevant change: the will of emerging economies to upskill their workforce to gain higher positions in the production chain.

Being well aware of the fact that the world wide production model set up by western multinationals to take advantage of the demographic drift, will be the first to suffer from economic slowdowns, emerging economies want to rapidly upscale their value chain turning their work forces into high level knowledge workers before the conditions change.

The Chinese Ministry of R&D has set a goal to reduce dependency of foreign technology to a share of 30% from more than 50% today whilst by 2020 Science and Technology Innovation in China is expected to rise to 60% in Economic Growth. (China Daily February 2006 on new RD spending boost in China)

With an annual cut of at least 1% in Europe’s growth for the next decade due to median age increase, it is evident that Europe needs to focus on ensuring the leading role as the cutting edge producer of qualitative knowledge workers in this evolving scenario.

This paper introduces new technologies and devices for “Instant Training” and “Personal Learning” solutions to boost personal development plans in Knowledge Economies, to help individuals needing to accelerate their Time to Competency and Time to Knowledge in this fast forwarding World.
TOWARDS LEARNING MEDIA BASED CONTENT PERSONALIZATION

The development of learning technologies over the last 30 years has been impressive, but only some technologies have better helped to achieve quantum leaps in the possible implementation of new educational strategies and models.

Figure 1: Towards Personal Learning Communities

Figure 1 shows that newly emerging Mobile & Broadband Internet technologies are about to boost higher levels of user interactivity and cross community collaboration, favoring a heavy migration from cognitive to constructive models for online learning & knowledge generation.

Blogs, Virtual Communities and Mobile devices are starting to demonstrate their effectiveness for online education, giving evidence that where workers and students interact amongst themselves, they construct cumulative knowledge far beyond self learning alone.

Interaction amongst students and employees adds a multiplication factor to the cognitive model each one develops when interacting with learning information and contents alone.

The learning implication of grouping would therefore alone be enough to justify the expected tenfold increase of mobile access to learning contents and experiences in the educational scenarios to come.

Figure 2: Towards Narrowcasting (Delivering contents to Ubiquitous, Nomadic and Mobile Personal Learning Communities)

On such evidence many organizations wanting to gain a leading position in the emerging competition towards Global Knowledge Society, are riding the tiger of mobile and ubiquitous access to personalized learning contents based on new innovative media and digital content distribution networks. As a result,
today, the economic forces represented by telecom and media industry, are starting again to rally the holy land of digital content for education.

Location based, context aware and “always on” access is becoming a must for workers on the move on a continuously evolving labor and professional market; and the nomadic learner is no exception.

_Narrowcasting_, i.e. delivering filtered information to profiled and clustered communities of interests is emerging as a new marketplace as opposed to the unfiltered and uncontrolled (by users) content delivery paradigm at the basis of the mass media market which has ruled communication over the last 50 and more years.

As the Tomita study performed in late 80s before the advent of Internet well depicts (figure 2), the evolution of media was missing a solution for effective and sustainable content personalization.

On the top of the chart we have asynch communication media (letter, book, film.), which enable to reach a variety of users but with no synch capability. Then, on the bottom of the chart, we have the flourishing of synchronous technologies (radio, television and telecom) where “time to inform” is the main value… The right side of the chart represents mass communication as a conglomerate of all media to reach mass, the main market which has established over he last 50 years as the main sustainable business models.

These three areas are the ones where most of the cash of the Industry flows today, but this happens because until now it was not feasible to do content personalization since “Self Sustainability” was reached only through larger target audience.

Now with the advent of Broadband and Mobile Internet access, _Narrowcasting_, a new way of communication, enabling us to reach very focused communities, is addressing the communication gap left by “traditional” media and more than 50 years of Broadcasting, where content quality was only sustainable by addressing Mass Markets audiences leaving personal communication and development out.

Today, publishing just in time educational contents to communities of workers and learners with specific and vertical interests, something quite usual in pre-mass media teaching and communication, becomes again possible.

Within Blogs, Podcasts and Mobile networks the Socratic way to teaching to communities re-emerges after years of mass media communication

**TOWARDS SKILLS BASED CONTENT PERSONALIZATION**

Given the scenario depicted in the previous paragraph it is not difficult to forecast that in the next years, users, including workers and employees, will want to get increasing nomadic and ubiquitous access to their online contents and communities of interest making Media Content Personalization, or _Narrowcasting_, one of the main teaching paradigms the future Digital Economy, with Mobile & Location Based Knowledge access becoming a converging interest of Publishing, Learning, Media and Telecom players in the very next future.

Delivering new Personalized Content Formats to workers on field scenarios, taking into account their devices, position and context of use will anyhow just be one part of the personalization equation.

The other big challenge will be to continuously match content delivery to workers pre-existing skills and competences well recorded and interchanged in standard Portfolios and Learner Information Profiles (LIPs).
Ambient Content, i.e. Content designed to favor seamless access to users whilst adapting to their skills and competencies, in the location they are, the digital device they have and the context they are in, will become the main format for content owners willing to position their services in the Knowledge Society.

Conceiving new Ambient Content formats able to adapt to the user background and skills, location and context of use, making this media revolution meaningful and satisfactory for the Knowledge Worker of Tomorrow’s Learner centric Organizations is the other big challenge in Content Personalization. (see Fig 3 for a positioning of Ambient Content related to other Educational Formats).

In addition, Skills based Personalization will require an important alignment exercise between different vocational systems at both international and inter-sector level (see Fig.4.) to make acquired skills rapidly recognized and transferable at a pan European level.

MOBILE AND SKILLS BASED EDUCATION… IS EUROPE READY?

Although Europe has always been at the very front of new learning and media technologies Research and Development programs, in general the European Industry has never been rapid to uptake innovation at start.

An unverified anecdote tells that when Gutenberg first disclosed his revolutionary invention to the then European scientific community, he was taken as the inventor of a useless solution presumably not capable to go beyond the limited scope of printing Bibles.
And we all know how that story ended and the value that technology represented for Education …

Today Europe’s RD is again at the front row of the Mobile and Personal Learning Revolution. Projects such as Mobilearn, WearitAtWork, Prolix and TenCompetence (Figure 5 and 6) have managed to set up interdisciplinary consortia bringing together telecom operators, broadcasters, content owners, Academia and Multinationals from leading European sectors (e.g. Avionics, Automotive, Pharmaceuticals, Energy, Telecom & Services) starting to demonstrate power and effectiveness of Personal Learning via context aware & location based information delivery to home, work, classroom and outdoor workers, keeping track of their needs, habits, skills and “digital story” whilst in their nomadic routing across organizations and labor markets.

Figure 5: Media Based Personalization in EU RD. The MOBIlearn and Wearitatwork Projects
Figure 6: Skills and Competency Based Personalization in EU RD. The Prolix and TENCompetence Projects

But is the European Industry ready to uptake such achievements or does the rapid pace at which this *Mobile & Personal Learning Revolution* is likely to take place, risk, once again, to meet the European industry unprepared and unfocused?

To avoid a skilling outrun, Europe has to rapidly conceive new learning content production and distribution models for its learning contents being economically viable, technologically advanced and pedagogically sounding.

To compete in the emerging international markets, higher degrees of content interoperability, localization and personalization must be achieved in Europe, preserving cultural differences yet underpinning alignment of diverse educational systems by means of technology and credits interoperability standards.

Learning Resources must be designed for future proof reusability and internetworking based upon new generation technologies such as XML and Web Services, adopting application profiles and fostering design by Content Objects to support flexible repackaging and re-versioning for different learning paths, contexts, profiles and devices.

Good practices in eLearning infrastructures and technologies together with needed pedagogic models, content formats and human resources skills and competencies must be rapidly promoted.

Publishing and educational innovation must be combined with new content management technologies, dedicated to learning and mobile deployments; better interchange and interoperability of learning contents across national borders and different vocational systems in Europe must be achieved. Alignment of educational systems and contents become mandatory.

**CONCLUSIONS**

Today the demographic drift in World Population brings new challenges to the Labor Market.

Together with upskilling strategies starting to emerge from new World economies, this drift can radically change the topology of labor in the next future.

Higher degrees of Knowledge personalization become the main challenge for leading Economies to keep their high stake positioning in such evolving scenario. Personalization that may be achieved by wider uptake of new mobile solutions offering location based and context aware access to Knowledge together with higher adaptiveness to learner’s skills, capabilities and backgrounds.

Underestimating the needed urgency for promoting such personalization methodologies and technologies is a great risk to currently leading Economies in the evolving World. A risk no Economy can afford to take in today’s high paced trend towards the Knowledge Society.
AUTHORS BIOGRAPHY

FABRIZIO CARDINALI was born in London, UK. He studied Electronic Engineering and obtained a degree in 1988 specializing in Artificial Intelligence and Machine Learning in the University of Genoa (Italy).

After launching and managing the Expert System and Multimedia division in Hay Space Consulting Technologies (European Hi Tech branch of World’s leading HR consulting firm HAY Management, Boston, US), he set up Giunti Interactive Labs, the new media and eLearning Company of Giunti Editore, the leading Publisher in Primary Education and Cultural Heritage in Southern Europe.

Today Giunti Interactive Labs is the main private eLearning Standardization and R&D contributor in Europe with official positioning in all major international sector standardization bodies and more than 30 ongoing RD projects on the future of eLearning, knowledge and ePublishing.

Giunti Interactive Labs is licensor of learn eXact, the first and leading Content Management Solution provider in Europe. learn eXact is installed in more than 500 eContent authoring teams worldwide and is now moving to Mobile, location based and context aware content management (eXact Mobile).

Today Fabrizio Cardinali is CEO of Giunti Interactive Labs and one of Europe’s main eLearning standards experts and author of numerous papers in international journals and conference proceedings on the future of eContent, with official roles in main international eLearning Open Specifications bodies (e.g. Technical Board Co-chair of IMS Global Learning Consortium, Board of Directors of European IMS Network, Vice President of European eLearning Industry Group, MIT’s OKI Global Strategy Advisor and ADL SCORM co-writer and reviewer). He serves as a regular expert for the European Commission Experts Group on eContent from DG Information Society and DG Culture & Education and on several National Governments eContent strategy plans for eLearning uptake towards the Knowledge Society (e.g. Recently in Italian, Russian and Polish national eLearning plans).

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PORTABLE REFLECTIVE ENTERTAINMENT PORTFOLIO (PREP)

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Abstract

Portable Reflective Entertainment Portfolio (PREP) is a new method of using Portable Digital Assistants, mind maps and “eportfolio thinking” all together in order to empower individuals to realise or improve their taste in art or other forms of entertainment. The method also allows its users to gain full control over their free time spent on leisure and entertainment.

Context

Eportfolios are used for a variety of different reasons in educational contexts. The two most important are: personal development planning and employability. There has been a lot of research into how an eportfolio can improve, impact on, affect the personal development of students within traditional educational environments (Barrett, 2004). Many papers concentrate on how an eportfolio can boost one’s employability. However, there is very little research on how some specific aspects of eportfolio practice can impact the way people spend their leisure time.

This issue is especially important when the huge amounts of time that students spend on leisure and entertainment are considered. Together with unemployed people and pensioners, students appear to be time rich (Lindskog, Brege, 2000). Their perception is that time abounds and associates with “killing time”. “Time killing” comes as an effect of a changing lifestyle as well as a very strong expectation delivered to them by TV and companies which sell entertainment. The message is very clear: you should spend your time watching our latest movie or listening to our latest hit single. When surfing on the web or checking their email, students are also exposed to a significant number of banners advertising or linking to places where music, movies or books can be purchased. The publishers of those websites fight for very precious students’ time and their money. Today’s students are bombarded by the Internet, TV, radio, books, games, movies, sports or other shopping activities and any of these activities carry almost unrestricted choice.

The pressure is sometimes so high that some individuals become victims of the TV or Internet addiction. Losing control over how they spend their free time they become so-called couch potatoes. The habit of watching TV or surfing the web for hours is as hard to break as commonly known cigarette or alcohol addictions (Kubey, Csikszentmihalyi, 1990). Spending huge amounts of time on meaningless entertainment leads to many serious complications in life such as not enough sleep, underinvestment in education or career. Students unable to concentrate enough to read a single article are now being targeted by computer games which contain some of the important data on news events.

Yet no one should deny the importance and need for relaxation and entertainment. Those things are critical for keeping the right work/leisure balance. What has to be emphasised is the necessity for the conscious decision making when choosing the leisure activities.

There are many treatises on traditional methods and approaches which can help to manage time and keep the right work/leisure balance. The importance of teaching students how to become self-regulated learners is described by Shapiro:

“Students were asked to set particular types of goals for themselves, such as completing of a certain number of math homework problems, and to self-record their effectiveness in achieving these goals. Students who set specific and proximal goals for themselves displayed superior achievement and perceptions of personal efficacy. Interestingly, simply asking
students to self-record some aspect of their learning, such as the completion of assignments, often led to "spontaneous" improvements in functioning" (Shapiro, 1984). These effects, termed reactivity in the scientific literature, implied that students' metacognitive (i.e., self) awareness of particular aspects of their functioning could enhance their self-control. Of course, self-awareness is often insufficient when a learner lacks fundamental skills, but it can produce a readiness that is essential for personal change (Zimmerman, 2001).

The monitoring of students’ free time can impact its quality and productivity. It can also help and encourage individual to invest more reflection in particular interests or hobbies. The Portable Reflective Entertainment Portfolio (PREP) is a way of becoming self-regulated recipient. By using the PREP method the learner has the right tools to reflect deeply on their free time activities by looking back at past experiences or planning future actions.

This new tool is needed to ensure that learners are in control of every aspect of their personal development including leisure. The richness and variety of the actual forms of leisure suggest that leisure should also be seen as the creation of meaning in a world in which work and the daily round are characterised by drudgery, insistsence and meaningless. (Dyer, 2002)

Furthermore, there is a proven link between the ability to learn and work, and the kind of entertainment people enjoy during their free time. For example, according to the Mozart Effect theory, listening to classical music, adults can do certain spatial tasks more quickly. The quality of entertainment affects individual’s personality, mood or approach to different professional tasks. Researchers seem to confirm the fact that the general public is frequently exposed to entertainment without the ability to make a choice. Many individuals try to take control over this stream and to systematise their interests. Moreover, a large proportion of those would like to improve the quality of entertainment on which they spend their time. The idea of Portable Reflective Entertainment Portfolio helps them with this task.

**Objectives**

Every eportfolio system highlights the importance of three elements: collecting, reflecting and presenting. A typical eportfolio system enables users to create the hierarchy of their goals, achievements or interests. Entering new data should be seamless, simple and easy so that daily update is not a huge task for the user.

The PREP enables users to use those functions, but by using mind maps it also supports them in the process of memorising what has been collected.

**Method**

The PREP combines mind mapping software, PDAs and so called “eportfolio thinking” in order to help the user plan their entertainment related activities, reflect upon them and memorise details about items they have gathered.

Researchers have concluded that users find the techniques of mind mapping to be useful, promoting better information and ideas retention compared to using traditional 'linear' note taking methods. Usually, learners use paper and pen to draw their mind maps. However, those tools cannot be used for the PREP idea because it is assumed, that the PREP mind-mapping diagram:

- has to be always expandable – based on the assumption that the diagram will be constantly growing;
- allows learners to make changes without affecting already developed parts – sometimes categories created in the past no longer correspond with their content and some branches have to be moved;
- enables the inclusion of additional files – attachments can considerably enrich the diagram helping to recall items;
- has to be scaleable giving an bird’s-eye view to enable full reflection on the shape of the diagram;

- has to be portable so that users can take it with them. It is crucial for the user to be able to save their diagram or its outline view using one of the most popular formats (.html, .doc, .xml).

In order to satisfy those requirements, the PREP uses a Personal Digital Assistant along with mind-mapping software instead of a pen and paper. PDAs are gaining in popularity and recently come not only as single-use traditional devices, but are also part of modern mobile phones. They are portable and enable the diagrams to be enriched with media files. As for mind-mapping software, there are several products on the market which make digital mind-mapping available for PDAs (e.g. MindMap/LX, Mind Image, MindManager, Pocket Mindmap, etc). Examples included in this paper were built using the Pocket Mindmap software (2006).

When the learner wishes to start building their PREP diagram, they can do it in three ways:

a) the initial diagram summarises previous experiences and time spent on entertainment – the learner starts building their diagram but firstly they systematise their past experiences (e.g. a collection of important movies viewed earlier)

b) mindmap checklist is created for items that are yet to be experienced – the learner builds a map which will help to create his collection of valuable entertainment experiences (e.g. the works of Chopin – Figure 1)

c) organically growing organisation of the items evolves as the items are experienced – the learner starts from the blank page and slowly builds up and updates their diagram adding daily entries.

Every single entertainment-related item on which the PREP user spends his time, such as a book, a theatre play, a CD, a movie, etc. is recorded and collected to the mind-mapping diagram. The diagram should be projected according to genres of entertainment. A typical PREP diagram is comprised of following categories:

a) genres of entertainment (literature, music, theatre, movies, etc.)

![Mindmap checklist created for items that are yet to be experienced](image)
b) genres of a) branch

c) particular authors, titles.

Once established, the PREP is systematically filled with items, details about all sorts of things that the user is entertained by. Information about the items can be made of something more than just text. The fact that the PREP operates on a PDA makes it possible to include multimedia files in the diagram. By using specialized software for media files compression the user can attach more than 10 hours of high quality video (320x240 pixels) on a single 2 GB memory card. The multimedia files can be added as samples of what has been seen or listened to. There are several websites which offer free movie trailers for download. Mp3 files can also be attached when describing music.

Adding fragments of movies, songs to the diagram entries can help focus and reflect on what qualities of entertainment are valuable for the user. Reflection on gathered items can be also done by answering questions (Why am I attracted to this type of entertainment?, What part of the item appeared to be the most interesting?, What personal qualities does this type of entertainment helps me to gain?, etc.). The user can also add reflections and reviews written by others. Such data is widely available on-line. By comparing opinions and points of view the user should be well prepared for any future discussions about the works.

Figure 2: The diagram with a reflective comment added

Apart from verbal reflection, the PREP enables visual reflection by bird’s-eye view on the diagram. The mind-mapping diagram displayed as a one big map consisting of several branches clearly shows the least developed sections or fields. It is the full picture of what user spends their time and money on. It also greatly contributes to the process of metacognition. This sort of information might be very useful when creating a CV, writing other self-oriented documents or presenting your interests to others.
Recommendations

Since the PERP method deals with the way students spend their free time, it should never be considered compulsory for students. It is an example of good practice which contributes towards overall self-discipline and self-regulation of the learner.

By making conscious choices and focusing on achieving set goals students should be able to view their leisure activities more critically. Long hours spent on watching TV will be noticed when summarising valuable daily leisure experiences in the diagram. The habit of making notes and summarising experienced events should impact the productivity in other areas (education, work, etc.). Once the idea is popularised, the screenshots and the use of learners’ PREPs could be shared and discussed on-line using social software platforms.

The concept of PREP is being continually improved by experimenting with different mind-mapping programs and portable digital devices. The idea can be promoted by institutions to encourage members/students as part of personal development planning scheme to help plan and reflect on what they spend their valuable time on. It is also a useful tool that contributes to the idea of life-wide learning.

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SHOULD UNSUPERVISED WEB SURVEYS BE USED TO CALIBRATE ITEMS?

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Abstract

Hezinet/BOGA combines both Intelligent Tutoring Systems and Adaptive Hypermedia Systems in a perfect symbiosis taking only the best of each archetype. The Intelligent Module consults an e-portfolio where the characteristics of the learner are stored and takes intelligent decisions based on Artificial Intelligence techniques. The e-portfolio is changed according to the results every time the system administers tests to the student to complete the assessment. The authors have defined four types of tests relating to the situation of the student in each course. There are tests for every 30 minutes of interaction calculated by pedagogue designers, named session tests. Besides, every 10 sessions there is another test, called layer test that covers the 10 past sessions. And finally, there is one final test, the course test, that covers the whole course. These tests are predefined and presented to all students. However, an adaptive system must include some kind of adaptation. Thus, when the e-portfolio reflects that a student has not obtained good enough results in a test, it compiles automatically some new tests with items about the contents that the system considers that have to be reviewed.

In such a system we consider that the starting e-portfolio is a crucial element. So, the authors only relied on people to fill the e-portfolio with the knowledge of every new student. But the resources necessary for the system increase with the number of new users, and they are only needed when the novice is introduced to the system. To automatically fill the e-portfolio, the authors thought of a new kind of tests: admission tests. These tests are administrated whenever a new student interacts with the system to guess his or her ability in order to determine the student’s initial course and layer. To achieve this goal, admission tests must include representative items that manage contents of the whole learning scope. At this moment, these tests are very rudimentary. Pedagogues have designed a set of 250 test items, each of them related to one of the ten difficulty levels. The system administers items related to each layer until the incorrect responses ratio is low.

Although this system could be appropriate to novice students, it is not for latter level students. If one optimistically considers that one person uses 30 seconds per item, the most proficient users should spend 125 minutes to complete the admission test (that is more than two hours!).

For these reason, the authors have developed a new type of admission test to automatically fill the e-portfolio that reduces the number of items to be administered to the student without losing precision and accuracy. This test is based on Computerized Adaptive Tests (CATs), which emulate the intelligent behaviour of human evaluators: a CAT dynamically selects and administers the most appropriate item depending on the previous answers given by the student. To identify the proper item from the item bank, the CAT algorithm makes use of some psychometric characteristics of the items, i.e. the parameters of an underlying model that is stated by the Item Response Theory (IRT).

The IRT provides very powerful techniques to carry out the evaluation, particularly when using CATs, but it imposes significant constraints. The most important one is that the item bank has to be calibrated, which means that some parameters of the evaluation items, such as their difficulty, must be statistically estimated. In order to collect accurate estimations for these parameters, the theory requires to collect at least 500 responses per item.

The problem that arises in such a situation is that it is practically impossible to find 500 volunteers to whom administer Hezinet/BOGA’s 250 admission items, at least when one lacks financial support. To
solve it the authors divided the bank into six 60 items-long subtests. Each test had similar difficulty and didactic properties and was administered separately to collect the responses of population-representative samples. The main idea was that as the subtests got shorter, the possibility to find volunteers resulted easier. However it was necessary to establish some kind of correlation between subtests, so all of them shared 22 items and were linked following a common-item non-equivalent groups design.

The subtest administration stage is probably the hardest one during an item bank calibration process, since it requires time and effort to apply so many items to so many individuals. To reach this goal, the authors developed a web-based tool to coordinate, simplify and manage the item administration tasks. Considering that it was necessary to get a sample of more than 3000 individuals (6 times 500), there is no doubt that the web reduced the number of problematic issues during administration, for instance, those related to logistics and organization.

Besides, since every answer was saved in a database, it was very easy to obtain automatically-generated reports that included up to date, ordered, precise, and homogeneous information about the subtest administrations. Moreover, the authors controlled the response times at item-level, something that results very useful to reject invalid answers and also to perform some psychometric studies about the items.

However, there were also some disadvantages in administering tests through the web. The most important one was that allowing any person to connect to the server could be an important source of adulterated tests, basically because it was not possible to distinguish which of the subtest administrations were serious and which of them had been completed just to try the web-application. Since this potential problem could mean an absolute lack of reliability in the results (i.e., the item parameter estimations), a preventive approach was implemented. Two types of test form administration were identified: first, supervised sessions, which were performed in schools, academies and universities, and second, non-supervised subtest administrations, in which volunteers completed a test through Internet at their own.

During supervised sessions, the administrator was responsible for assigning the examinees an identification code, so every individual was recognized and attached to a session. The supervisor also controlled whether the examinees matched some conditions of administration and therefore invalidated those that did not meet them. On the other hand, every individual that filled up a subtest not linked to a supervised session was asked to use as identification code her or his e-mail address or telephone number. In this way, the authors contacted every anonymous volunteer in order to determine whether the conditions were satisfactory or not, that is to say, to decide if his or her test administration should be validated or rejected.

The restrictions imposed to verify if a test form application should be approved or not were very strict, since the authors pretended the obtained results to be reliable. Subsequently, incomplete applications were discarded, as well as test forms with unknown, invalid or meaningless identification codes. Tests made by individuals that acknowledged that they completed their subtest without paying much attention, by chance, just to try the application, with continuous interruptions or even with some other’s help were also rejected. Test forms accomplished in more than 50 minutes or less than 5 minutes were also removed, as well as subtests including at least one item that took more than 200 seconds to be answered. Finally, the authors also rejected sessions linked to individuals that answered quickly (concretely, those among the fastest 15%) but did not prove to be better than the average examinee. As a result of administration stage the authors have found that more than 40% of non-supervised administration were rejected due to the strict conditions just mentioned. A total of 3976 completed forms were collected (2341 supervised, and 1635 non-supervised sessions), and finally, 3243 subtests were validated (2268 supervised and 975 non-supervised).

As a conclusion, the authors believe that Internet can be a source of knowledge, but very strict restrictions should be imposed in order to get accurate and valid results. Otherwise, undesirable data can easily adulterate the sample outcomes and affect subsequent stages by a GIGO (garbage-in, garbage out) schema.
Introduction

Evaluation is a key issue in computerized-aided learning because it is the usual way to identify the success or failure in the learning process. The number of e-learning platforms that integrate tools to assess students progress on acquiring knowledge, instead of delegating evaluation activities to some other external entity, is growing every day. Actually, the use of e-portfolios endorses the integration of evaluation modules within learning management systems.

This paper presents the current work on the subject of the evaluation module of one of these architectures: Hezinet/BOGA (Pérez, 2000), an adaptive hypermedia system that is currently used for Basque language e-learning, and which it is expected to become the first system that provides adaptive Basque e-learning and intelligent assessment at the same time (López-Cuadrado, 2003).

As a result of the integration of the Item Response Theory (IRT – Lord, 1952) in Hezinet/BOGA, the authors will obtain a system for e-learning languages that provides dynamically generated adaptive admission tests to assess which level would be the starting point for a new student, overcoming some of the problems associated to the enrolment of new students. These tests are Computerized Adaptive Tests (CATs). They emulate the intelligent behaviour of human evaluators, since they dynamically select and administer the most appropriate items, depending on the previous answers given by the examinee (Wainer, 2000).

IRT provides very powerful techniques to carry out the adaptive assessment by the implementation of CATs, but it also imposes significant constraints. Actually, to choose the proper item from the bank, the CAT algorithm needs the values of some psychometric characteristics of the items such as their difficulty, which are the parameters of the IRT model, to be statistically estimated by means of a procedure known as item bank calibration. The tasks required to achieve the calibration of an item bank are not complicated but time-consuming due to the large amount of individuals that every item has to be administered to.

The results of some author work, such as Hetter, Segall, and Bloxom (1994), encourage to perform a non-computerized item administration, since no significant differences were found in the calibration process, independently of the selected approach. However, for the Hezinet/BOGA case, the authors decided to use a web-based supporting tool for the administration stage, so this way the medium would be similar to the used during the CAT application (Glas, 2000) and at the same time the estimated IRT parameters would not be affected by the use of a different environment (Zickar, Overton, Taylor, & Harms, 1999).

If using a computerized medium offers many advantages, particularly when homogenizing, controlling and guarantying the administration conditions (Olea, Ponsoda, & Prieto, 1999), the fact of carrying out the subtest administration through the Internet provided some others. The supporting tool for the item application lied on a web-server that was on duty 24 hours a day, 7 days a week, thus everybody could complete a test form anytime and anywhere. Moreover, since the context in which the items are presented during the calibration process must be similar to the one used for the CAT administration (Wainer & Mislevy, 2000), performing the administration stage through a computerized environment avoided problems regarding the used medium. For instance, during a test form administration, items were shown one by one, exactly as a CAT does, something unthinkable for a conventional paper and pencil subtest application. Item responses were stored in a database in real time, so listing reports automatically resulted very straightforward. Finally, it was possible to control response times at item level, which was very useful to identify invalid administrations and also to perform psychometric studies about the items.

The following two sections will respectively present how Hezinet/BOGA manages its users e-portfolios and how the system initialises them. After that, the basics of CATs based on the IRT will be explained. Next section will discuss about the Hezinet/BOGA item bank calibration, emphasizing the different types of test form administrations (supervised and non-supervised) that were defined to get estimates for the item parameters. Finally, last section will present some data about the discussed calibration process, as well as the conclusions of presented work.
Hezinet/BOGA and its e-portfolio management

Hezinet/BOGA [1] is a commercial environment for distance language e-learning developed using web technology, multimedia and artificial intelligence techniques. At the present time it is used in more than 50 Spanish and 14 South American adult schools for Basque language learning. The system offers two types of operation: it can be used as a supplementary material during the instruction at the classroom, but also as an independent distance learning tool.

Hezinet/BOGA combines both Intelligent Tutoring Systems and Adaptive Hypermedia Systems in a perfect symbiosis taking only the best of each archetype. The Intelligent Module consults an e-portfolio where the characteristics of the learner are stored. It also takes intelligent decisions based on some Artificial Intelligence techniques. The system contemplates both constructive and instructive viewpoints. The student controls the learning process and at any moment he or she can decide which contents will be shown. Constructive approach includes those tasks that students can initiate in order to assimilate the contents they want to learn, usually starting from the challenge to solve a concrete activity. Instructive approach comes from the item compiler, which evaluates the student e-portfolio, and keeps track of which contents have been passed. Also the organization of the domain into contents adds some instructive flavour to the system.

From the user’s point of view, the objective is not just to learn but to do it in an entertaining way. To get this aim, Hezinet/BOGA includes an item bank with more than 10,000 different activities which are organized into different scenarios, including 364 videos, 703 audio files and 72 interactive films. The system manages up to 20 different types of activities, such as highlight mistakes in a text, multiple-choice, true/ false, free answer or ordering exercises, and compositions (or essays). The strategy that the system uses consists in challenging the student to solve activities, which are usually included in a more general context or scenario, which is called session. The user has some tools available to find the correct answer to those activities, namely: help windows, a Basque grammar reference e-book, a Spanish-Basque/ Basque-Spanish on-line dictionary, collaborative query utilities to ask the tutor and other students for help, an on-demand activity compiler, and a tool to review visited and pending contents that gives the student an overall view of how much (1) has been visited, (2) has been passed with success and (3) is still unvisited.

The e-portfolio is changed according to the results every time the system administers activities to the student, but also after an assessment test is completed. The authors have defined four types of tests relating to the situation of the student in each course. There are tests for every 30 minutes of interaction calculated by pedagogue designers, named session tests. Besides, every 10 sessions there is another test, called layer test, which covers the 10 past sessions. And finally, there is one final test, the course test, that covers the whole course. These tests are predefined and presented to all students. However, an adaptive system must include some kind of adaptation. Thus, when the e-portfolio reflects that a student has not obtained good enough results in a test, it compiles automatically some new tests with items about the contents that the system considers that have to be reviewed.

Not only does Hezinet/BOGA compile the tests, but it manages and assesses them too. Management is a relatively easy task since it just consists in presenting the items to the student. Though for the student the result of the assessment is just a percentage of success which is immediately given, more data is actually recorded by the system after the administration of a test. The e-portfolio is updated and the system stores which items have been used to avoid repeating them in the future. For every exercise the result is also registered. Evaluations in Hezinet/BOGA are about contents that the student has visited, so the user will not feel discouraged due to questions concerning not-yet-visited contents. Tests are dynamically compiled, so item exposure problem is avoided, since the system tries not to repeat items whenever it is possible.

How to initialise a new student e-portfolio

The starting e-portfolio is a crucial element for an e-learning system like Hezinet/BOGA, so the authors only relied on people to create the e-portfolio with the knowledge of every new student. But the resources necessary for the system increase with the number of new users, and they are only needed when the novice is introduced to the system. To automatically fill the e-portfolio, the authors
thought of a new kind of tests: admission tests. These tests are administered whenever a new student interacts with the system to guess his or her ability in order to determine the student’s initial course and layer. To achieve this goal, admission tests must include representative items that manage contents of the whole learning scope. At this moment, these tests are very rudimentary. Pedagogues have designed a set of 250 test items, each of them linked to one of the ten difficulty levels. The system administers items related to each layer until the incorrect responses ratio is low.

Although this system could be appropriate to novice students, it is not for latter level students. If one optimistically considers that one person uses 30 seconds per item, the most proficient users should spend 125 minutes to complete the admission test (that is more than two hours!).

For this reason, the authors have developed a new type of admission test to automatically fill the e-portfolio that reduces the number of items to be administered to the student without losing precision and accuracy. This test is based on computerized adaptive testing, which offers many advantages to those learning management systems that incorporate an assessment module: concretely, an increase of the security, a reduction of the time needed to pass the test and more precise estimations about the student’s real ability (Olea, Ponsoda & Prieto, 1999). CATs emulate the intelligent behaviour of human evaluators, since it dynamically selects and administers the most appropriate item depending on the previous answers given by the student. To identify the proper item from the item bank, the CAT algorithm makes use of some psychometric characteristics of the items, i.e. the parameters of an underlying model that is stated by the IRT.

**Computerized Adaptive Tests based on the Item Response Theory**

The IRT is an item-oriented proposal that overcomes the principal limitation of the Classical Test Theory (CTT), that is, the one derived from the dependence between the characteristics of a test and the traits of the examinee [2]. For example, students’ ability seems to be superior when administering an easy test; furthermore if students’ ability is high then one may think the exam is reasonably easy. Therefore the CTT does not allow to compare students who have passed different tests due to the relationship between tests and examinees.

The IRT is based on certain assumptions [3]: (1) if the student knows the answer to an item, his or her answer will surely be correct; (2) for every item, only one trait is evaluated at the same time; (3) the probability of answering correctly to an item does not depend on other items in the test; and (4) each item can be defined by a curve, the Item Characteristic Curve (ICC), that relates the probability of a correct response (vertical axis) with the student ability (horizontal axis).

As figure 1 shows, the ICC is a S-shaped curve. Depending on which IRT model is used, it is defined by several parameters or item features: difficulty, discrimination, pseudo-guessing and pseudo-failure. The definition of the 1-parameter model involves only the difficulty of the item; 2-parameter models are more general, including both difficulty and discrimination in their definition; similarly, 3-parameter models are generalizations where pseudo-guessing is also taken into account; 4-parameter models make use of the pseudo-failure as well, but their use is just theoretical since no practical advantages in their application have been found [4].
The pattern used in this context (in fact, the most used) is the dichotomous 3-parameter model. Being dichotomous means that the score of a response to an item can only take two values: correct or incorrect. Dichotomous models are divided into 2 groups: those that approach the ICC to the normal ogive by making use of integral calculation in their mathematical form, and the logistic models that approximate the curve by means of sums. Logistic paradigm is the most suitable for 3-parameter models, since they are easier to compute.

3-parameter model can easily simplify to a 2 or 1-parameter form by using default values. In fact, 3-parameter models do not use the pseudo-failure, or $\gamma$ parameter, as its value is set to 0. As previously mentioned, the features considered by 3-parameter model are:

- Difficulty, or $b$ parameter, is the ability where the curve presents its inflexion point, since it corresponds to the point where probability of a correct answer is half way between pseudo-guessing ($c$ parameter) and 1.0. It uses the same scale as the student’s trait: it is defined along the horizontal axis ($-\infty, +\infty$), being its middle point at 0. The bigger its value is, the more difficult the item is, so easy items will appear to the left and hard items to the right.

- Discrimination, or $a$ parameter, corresponds to the maximum slope of the curve, which is reached at its inflexion point. The bigger its value is, the more powerful the item is to classify students into several categories of a certain trait. However, the interval of the ability where this power is applicable becomes thinner. If this parameter is not used, its default value is 1.

- Pseudo-guessing, or $c$ parameter, is the probability that a student with low ability (left region of the horizontal axis) will answer the item correctly. If it is not used, its default value is 0.

Taking these parameters into account a function called Item Information Function (IIF) [5] may be defined to determine the information provided by every item. In psychometric terms, the information given by a test is the precision of the ability estimate. Thus, an item classification may be done to know which item fits better to a concrete ability level. And this is exactly what a CAT does: it selects the most appropriate items in the bank to fit the ability of the student, which is calculated by his or her previous answers. To choose the proper items, their parameters have to be known, what in terms of the IRT means that the item bank needs to be calibrated according to the used model.

**The Hezinet/BOGA item bank calibration**

IRT models are based on latent variables that cannot be observed, but estimated. This is exactly what the calibration of an item bank consists in: item parameters are estimated by some statistical method. The calibration of an item bank is not an extremely difficult process, but it requires time and effort since it involves administering the whole item bank to a large population. So, if the sample size is big enough, statistics will provide accurate item parameter approximations, and once the item bank is calibrated and available, the implementation and use of CATs becomes a fairly straightforward task.

The calibration process is typically carried out in five steps [6]: first, the item bank is divided into several subtests that will be then administered to collect the responses of population-representative
samples; after that, item parameters and subtest scores are statistically estimated; next, the computed
data and the IRT model correspondence is assessed; and finally, obtained scores and item parameter
estimates are equated, so that the whole item bank will use a common scale. The following sections
will describe each of these steps, stressing the particular case of the calibration of the item bank for
the Hezinet/BOGA admission test.

**Step 1: Dividing the item bank by an anchor design**

To start with the calibration of an item bank, one needs to collect the responses given by a large group
of examinees, at least 500 per item, that has to be representative of the population that will later use
the final item bank [7]. To perform such a dense task (many items, many individuals), and also
because of security matters, it is recommended to distribute the evaluation items into several test
forms or subtests and apply them separately.

The problem in partitioning both item and individual sets is that every subtest will be administered
independently, that is, without any relationship with the rest. Therefore, the values of the item
parameter estimates will not share a common scale; they will probably be identified in a different
range for each test form. An anchor design can solve this situation. The most typical approach
consists in using different (not necessarily equivalent) groups, with the intention that each of them
answers a different subtest, but having some items in common with the other groups. Then, the
estimates for the common items (which form the anchor item set) will be compared, providing the key
to equate the different test form scales and, consequently, to get a common one for the parameter
estimates of the whole item bank.

The authors have used an equating model known as Common-Item Non-equivalent Groups Design
[8], since it is the most suitable when the item bank is intended to follow the 3-parameter logistic
model. In this schema, the anchor item set is exactly the same for every subtest. This feature makes
the design to require more test form administrations than some other approaches, but it provides the
most consistent results, since it collects responses of the whole sample of individuals for the anchor
set. The common-item non-equivalent groups equating demands the designers to be careful when
selecting the items that will form the anchor set, because they must place much trust in them. This is
the reason why one should select an anchor item set which is representative of the whole item bank,
and to distribute the items in a proper way to obtain subtests that share the same specifications about
both content distribution and proportions. In other words, it is desirable all the test forms to be as
similar as possible, and also the characteristics of both the subtests and the item bank to be
comparable. Whenever an anchor item set is replicated in some tests forms, it is also necessary to
apply every anchor item in the same order and keeping the same position in every subtest.

The size of the anchor item set is another issue to take into account during the subtest design. From a
statistical point of view, the more anchor items the subtest has, the less the error will occur during the
equating stage. On the other hand, it is required a little set of items, for instance, if one wants to avoid
the negative effects derived from the administration of too many items to an individual. Thus it is
necessary to get a compromise: the anchor item set has to be as small as possible but large enough to
obtain a representative sample of the subtests and the item bank. At this point, there is diversity of
opinions; for example, Vale et al. suggest that the anchor set has to include a minimum of 15-20 items
[9], and Kolen and Brennan recommend it to be at least a 20% of the subtest, except for long forms,
where 30 anchor items could be enough [8]. Anyway, every subtest should be the same length and
require similar response times that do not reach extreme levels of fatigue for the examinees [6].

The 250 items of the Hezinet/BOGA item bank were distributed into six subtests by a common-item
non-equivalent groups design, so they were separated into 60 items-long test forms [10]. The anchor
set was composed by 22 items, which were placed in the same order and inserted in the same
positions in every subtest. The anchor item set was a representative sample of the whole item bank,
and the 6 test forms shared the same specifications, regarding both contents to be evaluated and
overall difficulty. The items were distributed depending on the pedagogical subject they handle
(verbs, declension, syntax, …). At the same time, the authors asked some Basque teachers and
pedagogues for preliminary difficulty estimates for the items in order to get an anchor design as
homogeneous as possible [11].
Step 2: Administering the subtests through supervised and non-supervised sessions

The subtest administration stage is probably the hardest one during an item bank calibration process, since it requires time and effort to apply so many items to so many individuals. To make the item application as similar as possible to the final CAT administration, and also to take advantage of the computer and web features, the authors developed a web-based tool to coordinate, simplify and manage the item administration tasks [10]. Considering that it was necessary to get a sample of more than 3000 individuals (a minimum of 500 examinees for each of the 6 subtests), there is no doubt that the web reduced the number of problematic issues during administration, for instance, those related to logistics and organization.

Since every answer was saved in a database, it was very easy to obtain automatically-generated reports that included up to date, ordered, precise, and homogeneous information about the subtest administrations. Moreover, the authors controlled the response times at item-level, something that results very useful to reject invalid answers and also to perform some psychometric studies about the items.

However, there were also some disadvantages in administering tests through the web. The most important one was that allowing any person to connect to the server could be an important source of adulterated tests, basically because it was not possible to distinguish which of the subtest administrations were serious and which of them had been completed just to try the web-application. Since this potential problem could mean an absolute lack of reliability in the results (i.e., the item parameter estimations), a preventive approach was implemented. Two types of test form administration were identified: first, supervised sessions, which were performed in schools, academies and universities, and second, non-supervised sessions, in which volunteers completed a test through Internet at their own.

During supervised subtest administrations, the administrator was responsible for assigning the examinees an identification code, so every individual was recognized and attached to a session. The supervisor also controlled whether the examinees matched some conditions of administration and therefore invalidated those that did not meet them. On the other hand, every individual that filled up a subtest not linked to a supervised session was asked to use as identification code her or his e-mail address or telephone number. In this way, the authors contacted every anonymous volunteer in order to determine whether the conditions were satisfactory or not, that is to say, to decide if his or her test administration should be validated or rejected.

The restrictions imposed to verify if a test form application should be approved or not were very strict, since the authors pretended the obtained results to be reliable. Subsequently, incomplete applications were discarded, as well as test forms with unknown, invalid or meaningless identification codes. Tests made by individuals that acknowledged that they completed their subtest without paying much attention, by chance, just to try the application, with continuous interruptions or even with some other’s help were also rejected. Test forms accomplished in more than 50 minutes or less than 5 minutes were also removed, as well as subtests including at least one item that took more than 200 seconds to be answered. Finally, the authors also rejected sessions linked to individuals that answered quickly (concretely, those among the fastest 15%) but did not prove to be better than the average examinee. As a result, more than 40% of non-supervised administration were rejected due to the strict conditions just mentioned. A total of 3976 completed forms were collected (2341 supervised, and 1635 non-supervised), and finally, 3243 subtests were validated (2268 supervised and 975 non-supervised).

Step 3: Obtaining estimates for the item parameters

The third stage of the calibration process consists in obtaining statistical estimates for both item parameters and individual abilities using as input the responses given to all the previously administered subtests. However, it is recommended to carry out some previous analysis, which are intended to detect and rectify existing anomalies. Some of these prior studies cover the identification of anomalous response protocols, conventional (classical test theory) analysis, and the assessment of examinees’ response patterns [6]. In the case of Hezinet/BOGA’s item bank calibration, anomalous
responses were identified during the previous stage, in particular those concerning extremely high and low response times. During administration sessions the examinees were invited to answer every item even if they did not know the correct option, so the number of omitted responses was very low (less than 4% for every item). Consequently, omissions were treated as wrong responses and successive studies were carried out considering this circumstance. The first of these studies was a classical reliability analysis, which provided adequate values for Cronbach’s alpha and Spearman-Brown coefficient (both of them higher than 0.8 for every subtest and also for the anchor item set). However, the authors identified and retired from the bank a total of 46 items, 6 of which were part of the anchor set, because they did not correlate significantly with the whole subtest, i.e. they presented a very low element-total correlation [12].

At this point it is also usual to verify that the item bank is one-dimensional, in other words, to confirm that every item assesses the same (one and only one) latent trait. There are many ways to perform this study, but the most widely used technique for one-dimensional dichotomic models is the exploratory factor analysis [13] of tetrachoric correlations [14]. The study of unidimensionality, which is essential for IRT one-dimensional models, should be performed in the next calibration step (assessment of the model-to-data fit), but it is possible to get on with it just before the parameter estimation because these estimates are not needed to assess the dimensionality of the item bank. The authors performed a study of unidimensionality for the remaining 204 items by the specialized software PRELIS/LISREL [15, 16] and the general statistical package SPSS. Since no items were identified as multidimensional, the item bank remained the same.

After revising and debugging the response matrix, and eventually removing some items from the bank (as happened in this case, because they did not correlate correctly with the whole subtest), one has to obtain item parameter estimates in order to maximize the data-to-model fit. There are many software programs that implement different procedures that provide, for every item, robust and invariant parameter estimates that matches the item characteristic curve following the corresponding IRT model [14, 17]. The authors used the program XCALIBRE [18], which implements the marginal maximum likelihood method by an EM algorithm to obtain estimates for both item parameters and subtest scores.

**Step 4: Assessing the model-to-data fit**

During this stage of the calibration process one must confirm that the selected IRT model and the parameter estimates empirically fit. Concretely, it is necessary to verify that the estimated values correspond to the observed ones, that is, to those obtained during the administration stage. If the IRT model and the item bank do not match, then any IRT property is lost: information about the items will not be reliable and, as a result, one will not trust in the ability estimates provided by any CAT that is generated from the item bank.

To assess how well does the IRT model fit the empirical data, it is useful to perform some studies, concerning (1) the IRT model assumptions, being the most important of them the analysis of unidimensionality, which, as said before, in most cases has been already done at this point; (2) the expected IRT model characteristics: it is desirable to verify that ability estimates are obtained in the same scale independently of which item set is administered, that item parameters do not depend on the sample used during the estimation process, and that a concrete precision is available for every ability level; (3) comparisons between model predictions and real data, i.e. analysis of the model scores for both simulated and real data about examinees with different ability levels; and (4) other issues, such as considerations about answering-time effects or the consequences of item omissions during the item bank administration.

As a result of the model-fit assessment, it is possible some items to be removed from the bank because their characteristics (i.e. their parameter estimates) do not match the IRT model. Fortunately, as cited before, this did not happen during the present study, and no more items were removed from the bank.
Step 5: Equating the item parameters

Once the item parameters have been estimated and after the inappropriate ones have been removed, the scales that measure the item parameters will surely be different for each subtest. However, since an anchor design has been defined, it is possible to use the anchor item set as a link to linearly transform these scales. This is exactly what the last stage of the item bank calibration process consists in: after equating the item parameters, the whole item bank will use a common scale that will be the same that states the ability estimates given by any CAT created from it [8].

One can find many different approaches to get a common scale for the parameter estimates. Some of them are based on the ICC [19, 20], and some others are based on scale score moments, as the mean/sigma method [21], which is the one used to equate Hezinet/BOGA’s item parameter estimates. This procedure is very straightforward to implement, so the equating step in this case was executed by the simple use of the general software Microsoft Excel [12].

Conclusion: should unsupervised sessions be used to calibrate items?

Having into account that it was necessary a sample of more than 3000 people for the Hezinet/BOGA item bank calibration, there is no doubt that web-based computerized administrations would avoid many problems, such as those related to logistics and organization. However, the fact of applying a test form to anybody could make the results to be adulterated, basically because it would be impossible to control which of the administrations were serious, in comparison to those having random responses or those performed by individuals that just wanted to test the application. Two kinds of solution were considered against this problem that could lead to an absolute lack of reliability in the item parameter estimates: a preventive one, consisting in lessen the risk before it appeared, and a curative one, which would treat the problem afterwards. In a project quite similar to the one presented in this paper [22] it was very difficult to distinguish the valid responses from those that should be rejected once all the responses were stored in the database.

In consequence, for the Hezinet/BOGA case, the authors chose the preventive solution; concretely, it was assumed that every non-supervised session was unacceptable unless the opposite was demonstrated, and the restrictions imposed to accept a non-supervised test form application were very strict. Actually, as table 1 shows, only 975 of the 1635 completed non-supervised sessions (a 59% of the total) were validated, while 2268 of the completed 2341 supervised sessions (a relation of 96%) were accepted [23].

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted supervised sessions</td>
<td>2268</td>
</tr>
<tr>
<td>Accepted non-supervised sessions</td>
<td>975</td>
</tr>
<tr>
<td>Accepted sessions (total)</td>
<td>3243</td>
</tr>
<tr>
<td>Rejected supervised sessions</td>
<td>73</td>
</tr>
<tr>
<td>Rejected non-supervised sessions</td>
<td>660</td>
</tr>
<tr>
<td>Rejected sessions (total)</td>
<td>733</td>
</tr>
</tbody>
</table>

Table 1 – Accepted and rejected sessions.

To determine if there existed any difference between both types of subtest administration, some differential item functioning studies were carried out [12]. The item bank was calibrated twice: first, only responses of supervised sessions were taken into account during the calibration process, and then, only responses of non-supervised test form administrations. A total of 29 items offered significant differences in their parameter estimates for both cases. This differential item functioning could be due to the administration conditions (supervised vs. non-supervised), but it could also be caused by the disparity in the sample sizes (about 375 supervised vs. about 165 non-supervised administrations per subtest). More research is needed to find out the real origin of these differences, which only affect 29 items.
The authors believe that Internet can be a source of knowledge, but very strict restrictions should be imposed in order to get accurate and valid results. Otherwise, undesirable data can easily adulterate the sample outcomes and affect subsequent stages by a GIGO (garbage-in, garbage out) schema.

References


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Towards the m-portfolio

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Introduction

This paper aims to identify some of the important issues about mobile technologies in relation to ePortfolios and to give an outline of work in progress by the authors.

The rapid growth of mobile technologies has implications for ePortfolios and portfolio learning. Most ePortfolios are dynamic database-driven applications accessed via the Internet. Modern personal digital assistants (PDAs), smart phones and other hand-held devices learners have high levels of connectivity (eg. via wireless networks), however, relatively little has been done to provide interfaces for these devices to Web-based portfolios. Moreover, research into the potential educational impact of mobile devices is limited and evaluation of there role in portfolio-related learning is still in its infancy.

The authors of this paper are exploring these issues and present ideas and work in progress within the health-related disciplines, but with wider applicability. Health-related disciplines are a good arena to evaluate mobile technologies because both undergraduate students and trainees tend to spend significant amounts of time ‘off-campus’ doing rotations (placements) in various hospitals and other locations. Access to desktop computers is limited at many of these locations and there is often a need to record activities at the point of care (eg. on the ward). Mobile devices therefore have potential to help meet these challenges.

Objectives

This paper has the following objectives:

- To present key issues for mobile access to portfolios and logbooks, including the potential for impact on education.

- To present summaries of cases studies of m-portfolios and present works in progress being undertaken by 2 Centres for Excellence in Teaching and Learning (CETLs) in the UK, the Mobile Innovation Center in Education, Fundación Santa Fe de Bogotá in Colombia, and in undergraduate Dentistry.

- To outline IT strategies that allows a synchronisation for sending information, notes, alerts between e-portfolio and m-portfolio.
Potential Educational benefits

Rapid advances in technology have brought about increased functionality and connectivity of PDAs and other mobile devices. This has great potential for learning, with ‘anytime anywhere’ access to teaching and learning resources, including online portfolios and log books. Many disciplines require learners to record learning activities, these range from structured ‘tick-box’ log books to reflective portfolios. The former can be more readily supported by mobile devices. However, with increasing sophistication and higher screen resolutions there is more potential to support richer learning with mobile devices that can capture and display text, audio and video. With the increased connectivity mobile devices can provide access to a wealth of Web-based educational material in addition to PDA-specific software, such as mobile textbooks. The communications features of mobile devices can also help support learning.

Challenges for the m-Portfolio – ePortfolio interface

With appropriate software portfolio and log-book data can be stored locally on the mobile device. When the device is ‘docked’ the data can then be synchronised with a networked database. However, with increased connectivity mobile devices can provide direct access to the Internet and therefore Web-based portfolios. This may be via phone (eg. GPRS) or via wireless networks (typically WIFI). There are pros and cons to either approach; if information is stored on the mobile device there is a risk of data loss and there is a lag in getting time-critical information onto a central database. Devices that can access the Internet can avoid these problems, however, learners may be in locations with no such access (eg. WIFI ‘blackspots’) or may be perturbed by the high cost of sending data by phone.

A key challenge therefore, is to develop both seamless offline (asynchronous), and online (synchronous) synchronisation processes. Ideally the m-portfolio needs to be able to update ePortfolio databases on the Web in a synchronous or asynchronous modes. Another complexity is the diversity of mobile platforms (PALM OS, Windows Mobile, and Symbian etc); it may therefore be advantageous to design an IT strategy for deployment of a m-portfolio that will support these different platforms.

Many log books require ‘sign-off’ by supervisors – this is commonplace in both undergraduate and postgraduate health-related disciplines. Often students go on ‘rotations’ (placements) around various health care organisations. At each location there may be many people who can sign-off an item for the log book. This represents a further challenge for the m-portfolio, the cases below include different approaches to this.

Case Studies

This paper will present cases studies that the authors are involved in:

Case Study 1. Pilot of PDAs in Undergraduate Dentistry (Palm project)

A prototype system to record student clinical data, through the use of PDAs was developed using Pendragon Forms (v3.1) over 4 years ago for undergraduate Dentistry at Newcastle University. This involved developing device-specific software
for students and staff to ‘tick off’ procedures in clinic. Staff have to be very mobile and many of them were already using PDAs.

PDAs were docked via a cradle with synchronisation to a database (MS Access) with data then regularly uploaded to a MySQL database with a secure website front end (Zope). At the time, Pendragon Forms was selected as a software solution as it provided a ‘pre-developed’ interface, ideal for the short time frame involved in this project. It provided a relatively easy to use design process with a large range of fields to select from but the version used was limited in the data formats supported. Data display was another major restriction that was imposed through use of this earlier version of the software. It did however provide a solution to data collection in a limited time scale that allowed the feasibility of the whole project to go ahead.

Lessons learned:

- Don’t underestimate resistance from users.
- Try to design the forms so that they are as simple and clear as possible, not always easy to do, small screens are easily cluttered and can confuse users.
- Record checks need to be used (i.e. form validation) as large amount of unusable data was entered.
- Using the device in one area and syncing it in another proved to be a problem, development or wireless technologies have solved this problem.

Overall this early PDA project proved a concept but to maintain it on a permanent basis using this setup would have proved to be very time consuming and open to a number of potential problems. The subsequent advances in wireless technologies now allow the developing undergraduate portfolio to greatly improve upon the initial pilot (see Case Study 5).

Case Study 2. CETL4HealthNE PDA pilot over a wireless network

The Centre for Excellence in Healthcare Professional Education (CETL4HealthNE) is a consortium involving the Universities of Durham, Newcastle (lead), Northumbria, Sunderland, Teeside and other NHS partner organisations, funded by HEFCE. It aims to develop new ways of sharing best practice in healthcare education throughout the range of health profession.

CETL4HealthNE has run a PDA pilot study with Medical students based James Cook University Hospital (JCUH). This utilised an existing secure wireless network which had been established as part of the “Hospital at Night” Scheme. The pilot builds on a strong experience of using ePortfolios for a range of educational purposes.

The pilot aims to test the feasibility of using PDAs to support undergraduate Medicine and to evaluate the educational and support impact of using PDAs to
provide students with wireless access to formulae, clinical guidelines, electronic portfolios and other Web-based materials.

The Web-based portfolio includes log books (Figure 1.) for specific rotations in which a limited number sub-set of procedures with reflection require sign-off by a supervisor. Supervisors can sign-off procedures on the student’s PDA using a scribe in a similar way in which they would sign-off a paper-based log book (saved as a graphic) without the need to log on.

The initial pilot study involved 30 students doing their clinical rotations at JCUH during March/April 2006. Students were given a pre and post use questionnaire collecting both quantitative & qualitative data. Feedback was also collected through a focus group.

The initial pilot demonstrated the feasibility of using PDAs for wireless access to Web-based formulae, guidelines and log-books in the context of undergraduate Medicine. Practical issues were addressed during pilot (clip-on pouches to improve portability + higher capacity batteries). Extended pilots of full rotations planned for 2006/7 including new ‘value added’ features of Hospital at Night (peer-to-peer PDA communications) will be evaluated.

Case Study 3. ALPS Pilots of Mobile Devices in Health Care

Assessment & Learning in Practice Settings (ALPS) is one of the 74 CETs funded by the HEFCE to promote excellence across all subjects and aspects of teaching and learning in higher education. ALPS is a collaborative programme between five Higher Education Institutions; the University of Bradford, the University of Huddersfield, the University of Leeds (lead site); Leeds Metropolitan University, and York St John University College.

ALPS are currently running 5 pilots of mobile devices in different healthcare settings. This includes a pilot to explore the use of mobile assessment focussing on the impact of the technology on radiography undergraduate and postgraduate assessment. The pilot is using Orange SPV M5000, T-Mobile MDA Pro, and IMD mForms.

An electronic assessment form developed for the Pocket PC platform was trialled with a group of radiography lecturer practitioners making a clinical examination of undergraduate and postgraduate students on placements around Leeds Teaching Hospitals. The project generated much discussion amongst the user group which has played a part in identifying technical and usability issues. Feedback provided by staff during the design stage informed the development process and led to an assessment form that met most of the user requirements and was fit for purpose.

Case Study 4. PDAs at Fundación Santa Fe de Bogotá University Hospital

The University Hospital Fundación Santa Fe de Bogotá (FSFB) is located in Colombia, South America. Founded in 1972, FSFB is now developing an undergraduate Medical School. The FSFB Division of Education incorporates an Innovation and Technology Centre and has an established history of developing new technologies, including considerable work with mobile technologies.

FSFB have been instrumental in setting up a Mobile Innovations Centre in Education to generate knowledge, capture experiences, and develop research plans
in mobile learning across Latin America. The Centre is aiming to use the latest research into how the brain works to inform the design of mobile applications, to explore new platforms for developing applications for mobile computing and smart phones, and to conduct research into the educational impact of these devices.

FSFB is aiming to develop in a full beta version a mobile-portfolio to be used for medical students during the coaching and mentoring process. It includes deployments for almost any kind of PDA model, along with a sync-process to an e-portfolio at FSFB.

**Case Study 5. PDAs over a wireless network for undergraduate dentistry**

A consortium of Dental Schools and Postgraduate Deaneries in the UK have developed ePortfolios for undergraduate and vocational dentistry. This built subject-specific tools on the ePET portfolio framework, initially developed at Newcastle University as part of an FDTL-4 project. Successful piloting of the Web-based portfolio with students at Queen Mary’s University of London (QMUL) and vocational trainees in the Northern Deanery began in September 2004. It has been rolled out in these institutions and subsequently at Newcastle University.

A PDA-friendly interface to the undergraduate dental ePortfolio has been developed and is being implemented at QMUL in 2006/7. This requires wireless access to the Web-based portfolio. On detecting that the device is a PDA a less graphically intensive interface is presented in which users can “tick off” procedures in a log book. Supervisors can “sign off” students’ portfolios within the busy clinical environment. Evaluation is at an early stage but it is hoped that this solution will prove more convenient compared to existing practice where supervisors needed to log-on to sign-off the portfolios of multiple students.

**Conclusions**

The case studies summarised here present a range of different approaches to meeting some of the challenges for the m-portfolio and their interface with ePortfolios. There are great potential educational benefits of the m-portfolio and their interface with ePortfolios. However, there is a need for collaborative development and careful research and evaluation in order to move towards this potential.

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1 Centre for Excellence in Healthcare Professional Education (CETL4HealthNE) http://www.cetl4healthne.ac.uk/

2 Rapid Response (Hospital at Night Scheme) http://www.ibleep.net


ePortfolios: adapting technology to suit pedagogy and not vice versa! Proc. ePortfolio 2005


7 Assessment & Learning in Practice Settings (ALPS)  http://www.alps-cetl.ac.uk/

8 Fundación Santa Fe de Bogotá  http://eng.fsb.org.co

9 FSFB Division of Education  http://divisiondeeducacion.fsb.org.co/

10 Mobile Innovations Centre in Education  http://www.m-learning.edu.co/

11 Dental ePortfolios  http://www.eportfolios.ac.uk/dentistry
1. Theme and issues addressed:

The proposed paper will address the conference themes of Learning and Implementation. Within the theme of Learning, the paper will focus on assessment and within the theme of Implementation, the paper will include issues related to implementation and scale.

2. Title of the paper/presentation:
Empowering Diverse Learners Through Large-Scale E-Portfolio Implementation

Preferred mode of presentation
Full research paper with 20 minute presentation

3. Author's name and institution:

Cummings, Katharine E.
Associate Dean, College of Education
Western Michigan University
Kalamazoo, MI 49008
USA

4. Abstract of paper:

Background/Context

The use of electronic portfolios has become “standard operating procedure” in many academic settings, but the portfolios themselves are sometimes limited to a standard set of artifacts. In some instances, the technology has overshadowed the role of the portfolio as a reflection of student development and individuality. When used thoughtfully, electronic portfolios provide many opportunities for students and educators to expand their understandings of reflective practice and explore their own development and vision.

In 2004, Western Michigan University adopted the e-portfolio product “iWebfolio” by Nuventive for students in all academic programs. Western Michigan University, has approximately 26,000 students enrolled in 157 undergraduate and 85 graduate programs. In addition to the adoption of e-portfolios for students, Western Michigan University provided iWebfolio accounts to all academic staff to support the creation of e-portfolios to support annual reports of professional productivity.

Electronic portfolios serve an important role in the assessment system for academic programs at Western Michigan University. Students use iWebfolio to create multiple portfolios for a wide range of reviewers. The flexibility of e-portfolios, however, is both a benefit and a hazard for their use in higher education. For example, some e-portfolios have seemed standardized in their format and content while others have reflected more “flash” than thought. Because electronic portfolios permit students to create and edit multiple portfolios using a variety of artifacts, they also should provide the opportunity for growth in thinking and reflection. To accomplish this greater benefit using e-portfolios, educators must themselves think more deeply about the multiple uses and purposes of portfolios.

Before the advent of word processing, the preparation of any typed document was a painstaking effort to create a “perfect” copy, because any error meant a complete re-typing of the document. Educators and students are now quite comfortable with on-screen composition, online submission, and continual editing of written documents. Unfortunately, the ease provided by word processing resulted in some unintended consequences, including students who used a single paper for multiple courses by simply editing a few sentences. Instructors have quickly learned to craft assignments that make such “recycling” less likely, helping students develop stronger research and writing skills.

In the same way, the advent of the e-portfolio permits a new way of thinking about individualizing portfolios for specific purposes and audiences. Rather than creating a single “perfect” portfolio to use for program assessment, job search, and self-reflection, students now may create multiple portfolios to address myriad purposes. The electronic format can be used to foster creativity as well, when educators craft portfolio templates that challenge students to stretch their own understandings and build their technology skills along with their reflection. The implementation of iWebfolio at Western Michigan
University has engaged educators and students in a multi-year effort to examine the purposes and potential benefits of e-portfolios for learning, assessment, and employment.

Objectives of the Project
In the iWebfolio project at Western Michigan University, Educators have:
· Examined assessment practices with e-portfolios
· Developed portfolio templates to guide, teach, and support students
· Created their own e-portfolios to document professional development
· Submitted program-level e-portfolios to accrediting agencies for program review purposes

Students have:
· Created e-portfolios in response to course-level assessment activities
· Developed e-portfolios as exit assessments in professional preparation programs
· Reflected on their academic and personal development within their e-portfolios
· Shared e-portfolios with instructors, peers, and external reviewers
· Engaged with the technologies to demonstrate their learning

Summary of Results
The iWebfolio project has resulted in the creation of thousands of student and instructor e-portfolios. E-portfolios are used for program assessment, for presentation of student work, for dissemination of materials, and for review of performance measures. A key element in the implementation of iWebfolio has been the frequent dialogue among e-portfolio users. Students and instructors have been challenged to expand their understandings of portfolios and assessment through the examination of portfolios and creation of templates for portfolio development.

The creation of portfolios, the development of templates, and the implementation of e-portfolios across a diverse university setting has provided some insights about the uses of e-portfolios for learning and professional development as well as some “lessons learned” about large-scale implementation of a commercial e-portfolio solution. Among the insights and lessons learned are the following points:
· The specific purposes for e-portfolios need to be discussed with each academic program area as a part of the implementation to assure that e-portfolios are an appropriate tool for the academic program and its students.
· E-Portfolios, like all technology solutions, are best implemented when they are solving an existing problem or issue. The technology should not drive the implementation. Rather, the needs of the program should be explored prior to selecting e-portfolios as a solution.
· Instructors, students, administrators, and other stakeholders should be included in planning e-portfolio implementation. “Top-down” implementation efforts may result in a less than enthusiastic response to the use of e-portfolios.
· Templates used to guide portfolio development also may serve as instructional tools, providing students with clear understandings of professional standards and expectations.
· E-portfolios are excellent tools for the presentation of accreditation and assessment reports. They provide clarity of purpose, ease of navigation, and documentation of review processes.

5. Address, e-mail and telephone number:

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1. Theme #1: Policies – Issue 5 - Social inclusion, Issue 3 – Celebrating cultural identity

2. Work in Progress with presentation

3. Using e-Portfolios to Widen Participation and Opportunities for Students from Minority Ethnic and Lower Socioeconomic Groups to Gain Entry to Higher Education.

Currant, N., University of Bradford

4. Abstract

Background:

The UK government is keen to see 50% participation in higher education. Increasingly students are choosing to study at their local Higher Education institution rather than living away from home. The University of Bradford serves a very diverse community (both culturally and economically) and therefore the University increasingly has a role to play in raising the aspirations and prospects for students in Bradford secondary education. A large number of students in Bradford come from family backgrounds where they will be ‘first in the family’ to participate in HE.

The University runs a Compact Scheme which is the main vehicle for engaging with students aged 16-19 in local schools. The Compact scheme in conjunction with the Enhancing Learner Progression (ELP) project started a module in October 2005 using an e-portfolio to help school students raise aspirations and apply to University.

Objectives:

The key aims of the e-portfolio module are to encourage students to study at tertiary level and to aid them in the application process.

A number of activities are undertaken by students in their first year of advanced studies. These activities aim to:

- Raise students’ aspirations by helping them recognise success,
- Encourage students to think carefully about their career options and the choices available to them,
- Encourage greater links between students and the University,
- Help students to be better prepared for university application and for their first year of study at University.

The activities include:

- Recording achievements in the e-portfolio to give them a better sense of what they are capable of doing and how much they have achieved.
- Reflecting on the learning and skills gained from any work or voluntary experience they may have undertaken in their e-portfolio.
- Analysing their strengths and weaknesses and produce an action plan in their e-portfolio to improve their weaknesses.
- Using the e-portfolio to research course and career options and record their findings.
- Recording experiences and relevant information to compliment the other activities and then use this to put together a personal statement in support of their University application.
Students are invited to attend University taster days and master classes and reflect on their experiences at the University in their e-portfolio.

Summary of Results:

Results so far indicate that having a structured approach to thinking about University has been beneficial. Students have been able to research around going to University at an earlier stage and this has encouraged them to think about their options in a more considered manner.

Students have realised that it is not just grades that are important to Universities and employers. They have been able to identify areas of weakness in their skills and experiences and take action to address these in advance of having to apply to University.

A small percentage of students who were less likely to go onto higher education have said that as a result of the e-portfolio module they are now more likely to consider applying to University. School staff have also echoed these results. Staff feel that the module is encouraging students to go to University and to get them to think more carefully about what they want to do at University and beyond.

We have not seen any significant differences between students from different ethnic backgrounds in how the e-portfolio was used or in how the students responded to the module.

Conclusions and Recommendations:

The use of an e-portfolio has allowed the University to provide a structured environment to help students prepare for University and University application. The e-portfolio module has allowed students to have closer contact with the University throughout their advanced studies. The internet based e-portfolio means that students can access their work from home or school. The e-portfolio tool and the e-portfolio module have been of considerable benefit to students and to the University.

The use of an e-portfolio tool is an option that has allowed the University Compact scheme to engage with more students that it had been previously able to do. This will allow the University to pursue its mission of widening participation into higher education.

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Abstract submission

Theme: Employability

Issues: (1) Seeking employment, (2) Managing learning and development, (3) Adoption

Preferred mode of presentation: Work in Progress with a 15 minute presentation

Title of presentation: The Australian experience in developing an Employability Skills e-portfolio

Author’s name: Curyer, Suzanne

Institution: education.au limited

Abstract:

The Australian Government contracted education.au limited, a Ministerially owned and not-for-profit agency, to develop and trial an e-portfolio to assist people of all ages to identify and record their employability skills, sometimes referred to as ‘generic skills’. In Australia, employer representatives consider employability skills to be those skills required not only to gain employment, but also to progress within an enterprise so as to achieve one’s potential and contribute successfully to enterprise strategic directions.

The e-portfolio is intended to assist individuals in their career development and planning, particularly making transitions between education, training and employment. The e-portfolio is also designed to enable individuals to forward information to employers when job searching.

The project included consultation with stakeholders to specify the e-portfolio scope and functionality requirements. The service was designed and built using available draft IMS e-portfolio specifications and current web-accessibility guidelines. The beta release was trialled with students from secondary schools, vocational training institutions and universities to evaluate functionality and users’ learning outcomes. Participants in public employment programs were also included in the trial.

Overall, the results of the trial indicated that the service meets the functional and technical specifications designed for an employability skills e-portfolio service. There were suggested enhancements from trial participants and education.au limited to improve the service and to support the learning outcomes of users. These include changes in the beta-release user interface and support materials for teachers, trainers and career practitioners.

At present the Employability Skills e-portfolio is a ‘demonstrator product’. Options for deployment and implementation for the Australian context are currently being explored.

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REAL WORLD INTEROPERABILITY – LINKING STUDENT MANAGEMENT TO EPORTFOLIO

Colin Dalziel, Pebble learning, Andy Everson Pebble Learning
Overview

This presentation will highlight the work of the JISC funded LIPID project which has used the Open Source Sweet.Net middleware toolkit to provide a link between the SITS student management system and the PebblePad ePortfolio system. The presentation will highlight the processes undertaken to complete the work and will demonstrate the facilities the interoperability adds to the ePortfolio.

Background

ePortfolios have rapidly occupied the foreground of innovative approaches to learning, assessment and personal development: though all conceptions of ePortfolios are far from innovative.

Eportfolios differ from other eLearning systems, such as VLEs, in that they are more concerned with the personal experience of learning than with an institutional concern for content delivery, subscription to services and tracking use. Within the ePortfolio, and wider, development community discussions of ‘learner data’ tend to conflate institutional data and ePortfolio data as an amorphous whole. These data types should be considered separately and treated separately, whilst recognising that they need to work in harmony to support claims of learning; of progression; of professional competence and of aptitude for new roles. Scott Wilson (2005) says: “An e-portfolio is a repository of information about a particular learner provided by the learner and by other people and organisations, including products in a range of media that the learner has created or helped to create alongside formal documents from authoritative sources, such as transcripts of assessed achievement, which the learner has chosen to retain.”

Linking the institutional data domain with the personal data domain remains challenging; an issue made more difficult by protective data gatekeepers. Dalziel/Sutherland (2005) highlight the problems of converging the institutionally held myopic data with the richer learner’s biopic information generated through a wide range of activities. Until data management issues mature middleware services, such as the JISC funded open source toolkit SWEET.net, provide an opportunity for learners to access institutionally held (and approved) data to their personal learning systems for onward use in online CVs; applicational presentations; and career portfolios. Notwithstanding obvious, and longer term, concerns for the meaningful authentication of qualifications, certificates, licences and transcripts; an immediate case for data sharing is the avoidance of unnecessary repeated data entry by the user e.g. name; address; contact details and courses studied.

SWEET.net has been developed to primarily to support group or affiliation data; this data is valuable in securing the space between the individual and the institution. In the case of PebblePad this information is used to manage teacher controlled ‘gateways’ which allow ePortfolio users to ‘publish’ work for institutional purposes. The use of gateways provides an obvious delineation between the personal ePortfolio assets and those created for formal purposes (assessment, accreditation, monitoring). The use of group information held by the MIS, accessed by the SWEET.net service, and provided to the ePortfolio system, allows teachers to manage multiple/diverse/large groups of learners without a burdensome administrative overhead.

In short, the implementation of SWEET.net at Wolverhampton in the space between the institutional MIS and the personal ePortfolio presents an opportunity to gain efficiencies for both the learner and the teacher easing their association with both and reducing potential barriers and objections to wider adoption of ePortfolio systems.

As the University of Wolverhampton has over 20,000 active students implementing such a middleware solution brings with it a number of challenges, particularly related to the extraction of large volumes of data associated with such a student body. For example listing every students’ module registration for a single semester returns over 80,000 entries. This creates a file which is difficult to transfer
between systems and is time consuming to import into a middleware solution. The student
management system at Wolverhampton, SITS, does not currently support XML export, therefore data
must be initially exported in comma separated values (CSV) format and processed into an appropriate
standard compliant IMS formats for handling within the ePortfolio. Generating and transferring large
data files presents a concern over the load on key institutional services which limits the opportunities
to process data to off peak periods. The institution is currently not supporting live updates between
systems on an individual record basis but favours the batch approach where a complete refresh of the
data occurs on a periodic basis, typically weekly. It is however envisaged that a more granular
approach will be taken in the future which will greatly reduce the data transfer overhead.

One of the key advantages of using a standardised middleware solution, which potentially supports
both XML and a CSV type import, is the flexibility this brings in terms of student management system
support. Whilst this project used the SITS students managements system, any system that can supply
CSV or IMS output could be used. The only requirement being a mapping exercise to ensure data
transferred to the middleware solution arrives in the appropriate field.

The PebblePad ePortfolio system has been modified to allow the import of the data from the sweet.net
toolkit. From a users viewpoint they automatically have basic personal information populated in the
system. For tutors the ability to draw upon list of students to initially populate groups is an option
which saves considerable time and effort over manual processes.

The first use of the system by tutors and students will be in the academic year 2006/07 so it is too
early to describe details of how the functionality works in a wide scale implementation. However
details of the work and the future finding will be posted on the project website at
http://www.lipidproject.org.uk

There is clearly considerable work required before ePortfolio interoperability becomes standardised
and widely adopted, however Open Source middleware solutions which are flexible and offer the
potential to work with a range of systems may provide a good basis to take work forward in this area.
Sweet.net was originally designed to support the grouping of students. This project has supplemented
the information supplied within the toolkit to provide a more detailed picture of the user. For the
Sweet.net toolkit to be the right solution for the needs of ePortfolio community it will need some
adaptation and extending so it includes a richer level of personal information required within a modern
ePortfolio system.

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Three approaches to Assessment ePortfolios in UK schools, 2001-2006

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1. Introduction
The purpose of this paper is to illustrate work in progress on 3 different ePortfolio projects undertaken by TAG Learning between 2001 and 2006. The oldest and biggest of the projects, MAPS, is an ePortfolio for the purpose of assessment. Focusing on providing a mechanism for evidencing and tracking student achievement, this system continues to grow and develop as the notion of ePortfolio matures. MAPS has also been the inspiration behind much of the technical and design detail of both the other innovative ePortfolio systems profiled in this paper, The Learning Journey, an open-ended ePortfolio with a balloon journey as its metaphor and E-scape, a PDA based ePortfolio for capturing ideas and design in a Design and Technology practical examination. Whilst all 3 systems are very much Assessment ePortfolios with much in common, each has a radically different approach. Each though has at its heart the aim of reflecting a student’s capability

2. MAPS

2.1. Background & Challenges
In 2001 TAG Learning began working with a far-sighted team of teaching advisors based in Worcestershire Local Education Authority in the UK on an ePortfolio assessment system. The focus of the system was two-fold:

i) to help the learner reflect on, understand and improve their own performance;

ii) to help educators share best practice in terms of making valid assessments of learner capability and hence also improve both the learner's performance and the teacher's performance.

From the research carried out by TAG and the Worcestershire team (and building on previous research by TERU at Goldsmiths in the 1990s) the system we called “MAPS” was born. “MAPS” stands for “Managed Assessment Portfolio System” and the emphasis in the MAPS approach has always been learner-centred and on trying to support a formative assessment process which helps both the learner and educator to grow.

2.2. How does it work
Everyone who uses MAPS has a MAPS "portfolio". What you see depends on your role: student, teacher, head of department, system administrator, moderator or LEA adviser.

Our aim is to try to ensure that the system is kept as simple as possible by only showing people what they need to see based on their role. So MAPS is not so much a system based on privileges and permissions, but on what you need to do - a subtle, but important difference.

Teacher Portfolio
In the teacher's portfolio are:
• His/her students
• Assessment tasks. There is a small, focused content-management system built into MAPS, which allows the teacher to combine a series of files, SCORM courses, QTI quizzes and instructions with a set of learning outcomes. The task and the outcomes can be tagged against the UK National Curriculum where appropriate. Additionally there are banks of ready-made assessment tasks covering the range of the National Curriculum.

Having created a new assessment task, or imported one from a task bank, the teacher then assigns the task to his/her pupils - setting a date when the task should appear to the pupils and date when they should hand it in.

**Student portfolio**
When the pupils log in, they can clearly see the task that has been assigned. They open it and can see all the instructions and resources (files, web links) that the teacher has uploaded for this task. The pupils can also see the outcomes - either written by the teacher - or imported along with the task (where the task was ready made task).

It is important to remember at this point that almost all MAPS users are being taught in a traditional face-to-face classroom environment. Hence the information in the MAPS task is a reference and a reminder; it is not the "teaching". MAPS is not a virtual teaching environment - it is there to support the teacher, it does not replace the teacher in any way.

When working on a typical task, students are asked to upload initial thoughts about the task and to upload any planning documents they have created. Then, as they produce them, they upload drafts and finally they upload the finished work.

When students upload work they are asked to indicate which of the outcomes (if any) the file they are uploading evidences. Additionally they are asked to comment on how things are going and to reflect on their progress.

**Annotating work**
There is a messaging/annotation system built into MAPS - it permits students to message their teacher about the task they are currently doing - and for the teacher to respond. These messages are then kept as a dialogue alongside the progress of the work - creating a form of process diary - an invaluable tool both for the teacher and pupil when assessing the work at the end of the task.

When a student is satisfied that s/he has finished, s/he presses the hand-in button and indicates which outcomes have been achieved - aided by their previous tagging of files against those outcomes. Students can also write in their own words what they feel they have achieved. Once the hand-in button has been pressed the student cannot alter the work uploaded - though the task can be re-opened by the teacher.

Once the student has handed in the completed task, the teacher can mark it online, seeing all the information about the task, including outcomes, alongside the work uploaded by the pupil - which shows the date and file size.

**Reviewing and assessing performance**
The teacher can then review the work and the pupil's self-assessment before grading the student. This is then an excellent opportunity for the teacher to understand the pupil's approach to the task and whether s/he has achieved the learning outcomes.
Once the work has been marked, the teacher can opt to put the whole marked task in the school gallery. The task can then be viewed by other teachers, and by other pupils who have already completed the task and had it assessed.

2.3. Work with awarding bodies
A key development with the MAPS approach to ePortfolios is the extensive work that has been completed to facilitate the evidencing of assessment objectives in a range of qualifications. This has meant designing and evolving over a number of years and a range of qualifications, an XML Schema for describing qualifications, units within qualifications, mark blocks and mark schemes, assessment objectives and referencing and marking requirements. This Schema is now sophisticated enough to profile qualifications ranging from skills based IT qualification such as OCR’s CLAiT, to cutting edge New Media Qualifications such as OCR’s iMedia qualification. In each case students are able to upload evidence of attainment against assessment criteria for the qualification unit. Self-assessment is facilitated as is the ability for students to reference their files. Assessors can link individual files to assessment criteria before marking. A Coursework Summary report also allows assessors to get an instant overview as to the progress of a student through the units of a qualifications as well as then being able to electronically submit completed work online to the complimentary awarding body ePortfolio where moderation is able to take place.

2.4. Progress to date
MAPS is an ePortfolio system tailored to the work flow of the traditional teacher student relationship. In this respect, it is not trying to do anything revolutionary, it is designed to evidence achievement to the benefit of both student and teacher. It puts the users at the centre of the systems not the institution. And in that quest we have over 50,000 student users spread over several hundred schools in the UK.

Recent developments have included the addition of discussion forums, SCORM content players and a new QTI quiz player. In the spirit of MAPS though, each of these technologies is seen as a simple component of each MAPS task or activity. It is the product of students’ creative energies that are at the heart of MAPS, not their progress through courses or their performance in multiple choice quizzes.

3. The Learning Journey

3.1. Background & Challenges
The Learning Journey began as The Dudley Challenges, a series of Learning Activities developed by teachers John Davies and Eric Tibble as an online learning resource for schools in 2001.

The Learning Journey is accessed via a website linked to a communications and ePortfolio system. Focusing on both individual and group/collaborative learning, the system aims to develop ‘reflexive’ learners who demonstrate interpersonal, reflective and active qualities. Each stage of the journey contains a range of tasks that include:

- Problems that when solved provide clues to each destination
- An electronic travelogue/blog capturing the essence of the location visited
- Opportunities to contact experts, advisers and the Learning Journey community e-mail
- Practical activities that encourage creativity
The Learning Journey's 'reflexive practitioner', through the range of activities, uses the ePortfolios to evidence

- interpersonal qualities: ability to work well with others, ability to network, support and empathise, ability to work independently;
- reflective qualities: ability to evaluate and persistency
- active qualities: ability to generate, model, analyse and construct ideas, ability to identify patterns of similarities and differences and make connections, ability to use ICT/digital tools/resources/devices.

Students work their way through missions; each mission being a stage in a metaphorical balloon journey, thus The Learning Journey. Missions themselves are then made up from 12 respective sections with section containing a series of open ended activities. These may involve problem solving skills or research on the internet. Students then work in teams to solve the problems presented, recording their reflections and ideas in their ePortfolio.

3.2. **How does it work**

3.2.1. **Student & Journey Management**
Students and teams are managed by the teachers. The same administration screens allow the teachers to track the progress of the students through the missions. As digital artefacts are gathered and tagged they can be used to help focus the assessment of the students’ progress. A mission timeline exists to allow teachers to get an overview of student progress through the missions. The timelines map the different types of artefacts that have been gathered to the different missions.

3.2.2. **Students on their Journey**
Students access the system through their own customisable interface. Within this interface are the main ePortfolio components. They have:

- Passport: snapshot of their progress
- Journal: blog of progress to date
- Timeline: visual representation of any artefacts put into the portfolio mapped to their progress through the Journey missions.

Through the same interface the students are also able to access the learning materials through which learning is driven.

3.2.3. **Assessment**
The Learning Journey has a unique approach to assessment. Unlike other assessment portfolios, the system is not driven by course rubric or assessment criteria. Instead, students are encouraged to reflect on their progress against a range of open ended criteria. These are:

- Enjoy:
  "How much do you enjoy learning"
- Think:
  "How much do you think about learning"
- Review:
  “How much do you think about what you have learned"
• Change:
  "How much do you think about the way you learn"
• Do
  "How many ways do you have of recording and presenting your work"
• Teamwork
  "How much do you help your team"

This then provides a snap-shot of a student’s progress through the missions in addition to artefacts and files uploaded as an illustration of progress through those missions.

3.2.4. Progress to date

The project has reached the end of its funding period and discussion has now begun around ways to take the project forwards. To date 2500 students have used the system across 34 different schools with positive feedback from the students. The key challenge for The Learning Journey does not however relate to the technology, it is more closely related to whether or not there is room within the constraints of the existing National Curriculum for such an innovative approach.

4. E-scape

4.1. Background & Challenges

In April 2004 QCA announced its strategic decision to take the lead in promoting e-assessment and e-learning. At the time it was recognised that the assessment of design and technology did not give any real recognition to the innovative, collaborative and creative approaches of students. New qualifications needed to provide opportunities for students to exploit new technologies in the recording of design ideas and solutions. They needed to move beyond the formulaic approach to current design and technology assessment practice.ii Thus the E-scape project was born.

E-scape is primarily research project funded by the QCA. Goldsmiths College was commissioned to undertake the research and tasked with looking in detail at the following:

• which technologies can be adapted for assessment purposes
• the ways in which a portfolio system can support and enrich learning
• the reliability and validity of assessments
• the comparability of data from e-assessments
• training issues
• the feasibility of national implementation.

Into the second phase of the research and Goldsmith’s in turn commissioned TAG Learning to design and build an ePortfolio system that would use PDA’s as the input devices. HandHeld Learning was commissioned to build the client software to run on the PDA’s themselves. PDA’s were chosen for their portability and flexibility; as handheld tools they lent themselves well to use in a Design and Technology classroom workshop where desktop computers would simply get in the way.

The E-scape system is in effect then an electronic examination. Lasting 6 hours, students create evidence mapped to 24 activities in which students design an object such as the packaging for a light bulb. These activities provide opportunities for brain storming ideas, planning sharing ideas, developing prototypes, reflecting on progress, and towards the
end creating an elevator pitch to ‘sell’ the idea to an imaginary investor. Each activity is timed and all of the students work on the same activities at the same time.

4.2. How does it work

The E-scape ePortfolio is built in its entirety around the MAPS technology. In addition TAG designed an XML Schema to describe a simple sequence of creative activities that can be completed using a PDA using special client software (in this instance, designed and built by HandHeld Learning: the data is in effect an examination script.) Such activities include:

- Draw a picture using a simple PDA based paint program
- Download from the server another user’s picture so as to be able to edit it
- Record a reflection using a simple PDA based text editor
- Take a photograph
- Record sound
- Reflect on a previous activity
- Collaborate: comment or edit the product of one my team members in a previous activity

Each element in the sequence describes an activity and how it is to interact with the ePortfolio server; it also indicates how long a student can spend on each activity.

The schema also provides for simple collaborative activity whereby I am able to comment or edit work produced by somebody else working in my team.

When students arrive in the examination room they are each handed a PDA. Also in the room is an ePortfolio server connected to a wireless router. When the PDA’s are switched on they immediately look for the ePortfolio server and confirm that the PDA has been given to the correct student.

![Diagram of device components and server](image)

**Figure 3**

The assessment is then administered from the server. When the examination begins the server signals to all of the PDA’s and the first activity begins, launching the students into a paint program where they can begin their first brainstorm. At the end of the 5 minutes they are given to complete the activity their work is automatically saved and uploaded onto the ePortfolio server.
Subsequent activities will send the brain-storm images to the PDA’s of team members where they will be able to comment on the ideas of their team mates. The final assessment will take into account this collaborative activity as well as the student’s own work.

At the end of the process the student’s completed ePortfolio is made available through a website for awarding body assessors and moderators to view.

Figure 5

4.3. Progress to date
The schools based phase of the project is now at an end. Portfolio data was generated across 15 different pilot schools with nearly 350 students participating uploading over 10,000 artefacts across each of the 6 hour assessments. Assessors are at the time of writing now using the moderator’s system to begin making their judgements about student performance.

It is hoped that a third phase to the project will begin work in the new year with a new round of funding. This third phase will investigate the use of the technology in contexts over and beyond the design and technology focus the project has had to date.

5. Conclusion and Reflection
As has been discussed and documented all too regularly by those involved in the development of such systems, ePortfolios cover a wide range of aims and activities. The three systems described above are examples of just one branch of ePortfolios. Assessment ePortfolios, they are based on very similar technologies and yet each has a radically different approach. Each is suited to the task for which it was designed with the difference between them reflecting the contrast in approach to assessment much more than contrasts in approach to ePortfolio.

As devices for creating ePortfolios becomes smaller, more personalised and more feature rich we can expect the depth, breadth and quality of ePortfolios to grow also. At the end of the day the goal of Assessment ePortfolio is the best reflection of a students capability; the goal of developers then is to develop tools with which to edge us ever closer.

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OMNIPRESENT EPORTFOLIO ACTIVITY ENABLED BY A MOBILE APPLET AND SYNCHRONISATION SERVICE

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Abstract

In this paper the author describes issues regarding practical considerations and implementation issues associated with utilising mobile technology for ePortfolios. An alternative to purely Web-based mobile ePortfolio service provision is discussed where ePortfolio data can be harvested without being connected to the Internet.

A user can add harvested data to their Web-based portfolio when the user deems convenient, enabling ePortfolio activity to occur anywhere at anytime. GPRS and 3G services that provide mobile Internet access can also be avoided to reduce the cost of using mobile ePortfolio solutions. This is achieved through synchronisation of data gathered on a mobile device with a Web-based ePortfolio service by means of a desktop PC service bridge. A prototype implementation, Mobifolio, is presented and future developments described.

Introduction

Network based computing services are pervading through the growing widespread connectivity of mobile devices to the Internet. Desktop-based tasks and activities can now be enabled and accessed on the move with new technologies bringing computing services closer to users.

EPortfolio services can now be brought closer to and made more available to users through the use of mobile technology. The mobile web in particular will gain significance over the next few years in the wake of the ever growing 3G network market, and the dot mobi domain being released this year placing particular emphasis on mobile-web development. Short Message and Multimedia Message Services (SMS/MMS) are also already widely used for interfacing with Internet based services. Therefore enabling mobile ePortfolio services should be straightforward. However, many mobile Internet services (such as moblogging) make some assumptions that may stifle and discourage the user experience. Consider the following:

- In Web-based mobile services, it is assumed that Internet connectivity will always be present. Internet based services are easily accessible from a desktop PC where connectivity is for the most part guaranteed. However, from a mobile device accessing the Internet is expensive through GPRS and 3G services as the user is charged for the amount of data traffic. Users will not always want to bear this additional cost, and connectivity to the service is reliant on phone network availability.

- Like mobile Internet access, SMS/MMS services depend on phone network availability. Also these services are limited in functional scope due to the inherent nature of text and multimedia messaging as the only interactive component. SMS/MMS services also push cost onto the end user, and only provide limited media and interaction. For many organisations, setting up an SMS/MMS service infrastructure might also infeasible.

Exceptions to the abovementioned may include devices with WiFi connectivity, such as certain models of personal digital assistant (PDA). Such devices are a minority in the consumer mobile market and are often only used by business professionals and the technologically savvy.

To overcome these problems associated with the high cost of using and dependence on availability of mobile phone networks, researchers from the Centre for Advanced Computing and Emerging Technologies (ACET Centre) at the University of Reading have looked at how a mobile phone can be used in a highly disconnected state for ePortfolio activity.
**Pervading ePortfolio Activity**

A user can be provided with the facility to add to their portfolio without the need for an Internet connection. Here we consider ePortfolio activity as being any task that adds to a portfolio – in particular blogging and harvesting media. These activities do not necessarily require access to read and review the current state of a portfolio and can therefore be carried out without any communication with an ePortfolio service.

For example, a person may wish to write their blog as situations unfold, or may have a passing reflection on some experience that they wish to record there and then. Someone may wish to take a photo of a piece of work they have produced or record a musical performance of theirs to showcase in their portfolio. By providing software that allows persistence of ePortfolio data whilst on the move, synchronisation with Web or PC based services can occur when a users’ preferred mode of connectivity is available.

This kind of service may be desirable as it enables users to record experiences and thoughts whilst away from a computer and even away from Internet access. This method allows for circumventing the use of GPRS or 3G phone network services making ePortfolio activity more economical for users who do not require instant access to and instant feedback from services.

**Mobifolio**

The *Mobifolio* project is developing a media harvesting applet leveraging technologies that can enable ePortfolio media to be saved and managed on a mobile device. A desktop application can be used to act as a bridge between the applet and Web-based ePortfolio services for synchronisation as illustrated in figure 1.

![Figure 1. Illustration of ePortfolio service bridging using a desktop PC.](image)

**Enabling Technologies**

The main operating systems that software can openly be developed on mobile platforms are Symbian OS, Windows Pocket PC Edition, and Palm OS. These operating systems tend to be included on higher-end mobile phones and smartphones. However, many mobile phones are shipped with the ability to run Java 2 Platform Micro Edition (J2ME) [1] software allowing for a broader possible target for mobile ePortfolio software. The *Mobifolio* mobile applet is based on J2ME technologies.
In order to cater for different hardware specifications of mobile phone, the *Mobifolio* applet has been designed to utilise different modes of connectivity between phone and desktop PC. Types of connection available on mobile phones include the following (illustrated in figure 2):

- **Direct cable** – Most mobile phones allow for direct serial or USB connections to a desktop PC. Cable connections first became commonplace for maintenance purposes, such as inspecting software setups and backing up data.
- **IrDA interfaces** [2] – Infrared technology has been provided on mobile phones for a number of years, initially enabling connections between laptops and phone to utilise mobile phones as a wireless modems. Phone to phone communication is also possible through IrDA interfaces.
- **Bluetooth** [3] – Short-range wireless connectivity (~10 metres) is possible by using Bluetooth technology between many devices including mobile phones to desktops, and also for connecting PC peripherals like printers, headsets and mice.

![Figure 2. Multiple modes of direct mobile to desktop connectivity](image)

J2ME provides specifications and APIs for handling each mode of connectivity through the Generic Connection Framework [4] and all modes will be catered for. When deploying the applet on a mobile phone, the software will dynamically determine what connectivity hardware is available and will allow the user to choose which mode to use for connecting to a desktop PC.

For the desktop synchronisation service, Java technology is again used. Java 2 Platform Standard Edition (J2SE) [6] allows programs written in the Java language to run on different operating systems. Java software is written and compiled once and can then be deployed onto varying operating systems such as Microsoft Windows, Linux, and Apple Mac OS. This is to again attempt to target a wide as possible market whilst significantly reducing development time and effort. J2SE provides similar specifications and APIs as J2ME, along with more advanced libraries for the more capable hardware available on desktop machines.

To allow the desktop service to communicate with Web-based ePortfolio services, ePortfolio functionality is to be exposed through using XML-RPC [7] or SOAP [8], both of which allow client software to execute service commands in Web software. Analysis of current Web-based ePortfolio software must be carried out to determine whether client software can utilise existing remote interfaces or whether these interfaces must be developed.

**Current State of Prototype**

A prototype of the *Mobifolio* software has been developed and tested to validate the proof-of-concept of bridging an ePortfolio service between mobile and desktop PC to Web. A simple J2ME application, shown in figure 3, was created to allow a user to persist textual blog data. The application can search for Bluetooth devices that provide the ePortfolio synchronisation service. The J2SE synchronisation service application, the test graphical interface of which is also shown in figure 3, has been developed.
utilising the Avetana JSR-82 implementation [9] that enables Bluetooth applications to be developed on desktop machines. The synchronisation service runs a Bluetooth server that allows the mobile application to connect and upload all of the blog data that is stored in the mobile applet.

![Image](image.png)

*Figure 3. Mobifolio applet (left) and synchronisation service graphical interface (right).*

An analysis of one open-source ePortfolio software, Elgg [10], found that an XML-RPC interface allows for client software to post data into an ePortfolio. Elgg enables blog and file posting by implementing a number of commonly used blogging service APIs such as the Blogger, MetaWeblog, MoveableType, and LiveJournal APIs. The synchronisation service application utilises Apache XML-RPC [11] to execute MetaWeblog [12] and Blogger [13] procedures exposed by Elgg for posting blog items.

**Ongoing Development**

At the time of authoring this paper, *Mobifolio* is limited in its functionality and much more work is required and in progress. In order to provide richer ePortfolio activity the following features are to be implemented:

- **Multimedia harvesting**: The Java Mobile Media API (MMAPI) [14] is being used to enable access to mobile phone media gathering capabilities. MMAPI enabled phones allow for mobile applets to use, where available, built in cameras and audio recording facilities. EPortfolios commonly incorporate a range of media including still pictures, video, and audio recordings. Recorded media files are much larger than pure textual data, and would therefore be more exhaustive on a mobile phone’s bandwidth usage – further adding weight to the need for a more economical solution for mobile ePortfolio service provision, such as the one presented here.

- **Richer text support**: Weblog authors commonly incorporate extra formatting into their posts through using HTML tags for presentation and linking to other resources. With *Mobifolio*, it is proposed to include facilities to format posts without using HTML, but through using a simplified and tailored form of WikiText [15]. The synchronisation service can then use these formatting instructions to appropriately render posts for a particular ePortfolio service. A form of WikiText has been chosen over HTML, because WikiText uses significantly fewer formatting tags and therefore may be easier to read on a mobile phone screen during the authoring process.

In terms on interconnectivity, the facilities provided have to be more complete. This includes connectivity on the mobile-end, desktop synchronisation service, and possibly the Web software interface. Work is being carried out to fulfil:

- **Complete connectivity**: The Mobifolio prototype currently only implements Bluetooth as a transport mechanism between phone and desktop. To target a fuller potential user-base, support for IrDA and direct cable synchronisation will also be implemented.
Multiple ePortfolio interoperability: Mobifolio has been shown to be able to operate with one ePortfolio system, Elgg, and has been architected to easily plug in mappings for others. An analysis of other open-source systems, such as Open Source Portfolio (OSP) [16] and dotFOLIO [17], will be carried out to determine whether they are suitable for accessing with client software (in this case the synchronisation software), and if not, work will begin on developing suitable interfaces.

Summary
This paper discusses issues regarding mobile ePortfolio activities. The author considers how to enable a user to add to their portfolio without the necessity of a direct connection to the Internet from a mobile device. This enables a person to carry out ePortfolio activity in the absence of the Web-based service that they may be using. By exploiting underused technology that is present in many mobile phones, synchronisation with Web-based services need not rely on mobile phone Internet services such as GPRS and 3G Internet. Mobile phones can also be utilised as media gathering devices potentially enhancing ePortfolio experience.

The Mobifolio prototype has been described and has shown that the concept of service bridging between mobile phone and Web-based ePortfolio software can work, where blog data can be synchronised through Bluetooth to a desktop PC, and then in-turn through XML-RPC to the Web-based Elgg ePortfolio software. Once Mobifolio has been further developed to include multimedia harvesting and more comprehensive connectivity facilities, a study is planned to validate whether such software is desirable and useful in users’ ePortfolio activities.

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AIMING FOR ULTRA-SCALABLE EPORTFOLIO DISTRIBUTION USING PEER-TO-PEER NETWORKS

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Abstract

In this paper the authors discuss how peer-to-peer technology offers a practical solution to building highly scalable Europe-wide and worldwide ePortfolio networks over existing network infrastructures. This solution also offers the effect of empowering individuals through moving the management and storage responsibilities onto the portfolio owners, decoupling users from any single institutional ePortfolio service provider.

The authors do not present this solution as the single way forward, but as an alternative to what is seen as a mainly client-server and Web-based approach to ePortfolio development, and to encourage developers to explore the possibilities for ePortfolio integration with emerging and relatively immature technologies. A prototype implementation is reported and future developments described.

Introduction

Today there are almost 500 million citizens in the EU. In order to even consider a system that can support the EuroPortfolio initiative’s aim of enabling every EU citizen to have an ePortfolio by 2010 [1], one must consider the following desirable qualities of such a system:

- **Scalability** – The ability to allow a networked system to scale hugely without the need for additional network infrastructure to be introduced to accommodate growth. For everyone in the EU to have an ePortfolio, a system that can scale up to hundreds of millions of users may be needed.
- **Platform interoperability** – For such a large user-base, network and platform diversity will exist. In order to cater for this, technologies to allow interoperability between different network and operating system platforms must be present.
- **Device heterogeneity** – Diversity not only exists amongst network and operating system platforms, but also in the classes of hardware itself. Consider that if mobile technologies such as Personal Digital Assistants and Smartphones are growing in prominence today, by 2010 they may be commonplace and perhaps even a new breed of technologies may emerge.

Existing client-server computing models may not be able to support such a system where ePortfolio data is being constantly being generated, updated and searched for by millions of people. Organisations might have to add significantly to their hardware resources and support staff to maintain such a large and widely used service.

Researchers from the Centre for Advanced Computing and Emerging Technologies (ACET Centre) at the University of Reading are developing a knowledge management application that aims to incorporate the aforementioned qualities [2]. This application allows for search and metadata annotation for any resource document and thus is used as a basis for a distributed system for ePortfolio management.

Ultra-scalable Technology: Peer-to-Peer

Peer-to-peer (P2P) computing has been around for many years now, and the popularity of file-sharing networks has put a spotlight on P2P technology. The P2P music file-sharing network Napster at its peak boasted a user base of over twenty six million users [3]. Napster enabled a large amount of pirated music sharing and the software authors were soon forced to stop supporting the software.
However file-sharing networks such as Gnutella, Kazaa and BitTorrent are still extremely popular, most of which are still used for unauthorised sharing of files. Despite the fact that these networks are used for much media and software piracy, the technology that enables them is extremely powerful for creating large scale networks.

P2P computing differs from the traditional client-server model of network computing. In the client-server model, all of the functionality of a service is centralised and performed by a server. The users accessing the service are called clients and have a more passive role in that they do not provide any service themselves, but only consume the service. Figure 1 shows how client desktop PCs connect to a server to access a service.

![Figure 1. Centralised service provision (Client-server model)](image1)

With the P2P model, the service provision is completely decentralised. It is assumed that all participants in the network form a network of equals – each peer acts as both a client and a server at the same time. This allows users to utilise their own computer hardware to help maintain the networks itself and removes the reliance on any institution to provide and maintain a given service. Figure 2 shows us that communication in a P2P network is between desktop PCs with no single server (or set of servers) to provide any service.

![Figure 2. Decentralised service provision (P2P model)](image2)

P2P computing has been enabled for regular computer users because of the increase in accessibility of increasingly powerful computer hardware and the rise in bandwidth accessible to home users through broadband Internet connections. More powerful applications can make use of this extra computing power and speed of Internet connections, and P2P computing can exploit this for creating decentralised network services.

The decentralised nature of P2P networks brings specific advantages for creating networked services.

Decentralisation increases economic efficiency when providing a service [4]. Where there is no expensive server hardware to run, an organisation can rely on end-user hardware for service
provision. Single points of failure are also eliminated as there is no one server or set of servers providing the service. When a centralised system fails, it is usually because of hardware, software and network failures. In P2P networks any single failure is highly unlikely to cause a failure in the overall service provision as the service is replicated throughout on end-user machines.

Decentralisation also provides the important ability to scale networked services. Enterprise level centralised servers are able to handle huge numbers of users, but whenever the service needs to support a greater capacity, the only solution is to add server hardware. In a P2P system, the more users there are the more accessible, efficient and robust the service becomes as the more peers there are in the P2P network, the greater the hardware capacity of the system. A highly scalable service model is ideal for creating large-scale networks such as one that would provide ePortfolio services to a Europe-wide or worldwide user base.

**User Empowerment through Edge Services**

An added benefit to having a P2P ePortfolio service is that users might feel more empowered by having more control of their personal data when their portfolios are stored on their own computing device. By using centralised services, users must put their trust in organisations to adequately secure personal data and this may suppress the desire to add to their portfolios. There is also an issue of ownership of the portfolio data.

In the case of an institutional ePortfolio services, the user is always dependant on the institution’s service. For example, a higher education college may encourage use of ePortfolios whilst a student attends the college, but what will happen to that data after the student graduates? The P2P solution pushes ePortfolio management and storage onto the portfolio owner at the edge of the network, where it is up to the discretion user who they share their portfolio data with.

**Coco: Solving Scalability, Robustness, Interoperability and Heterogeneity**

When considering ePortfolios in the context of P2P computing, we must look at what a portfolio is in terms of computing technology. The definition of an ePortfolio is constantly evolving; however a definition that is useful for defining technological requirements is as follows:

> “An ePortfolio is a digitized collection of artifacts, including demonstrations, resources and accomplishments that represent an individual, group, community, organization or institution.” [5]

The important aspects of this definition are that it is a digitized collection and it can be representative of an individual, or a group of individuals (organisations and institutions can be considered groups). From this we abstract the notion of an ePortfolio network service as one that provides portfolio authoring and distributed collaborative authoring capabilities, and search and retrieval of remote portfolios with the possibility of restricting access to secure groups.

The Coco project developed at the ACET Centre provides a suitable starting point for creating an ePortfolio network. The aim of the Coco project is to develop a framework that supports collaboration enabling users to self-organise and communicate, share tasks and content, and interact across multiple different computing platforms [6]. Coco is designed on a P2P network to address the aforementioned issues with scalability and resilience, and built on the platform agnostic technology, Java [7], and platform independent and P2P network protocols, JXTA [8], to make network services as highly available as possible. Coco provides group management and resource search facilities via the Coco content network [2], thus the Coco framework is used as the platform for creating a P2P ePortfolio network.
The P2P Portfolio Prototype

The P2P Portfolio project is developing a peer-to-peer ePortfolio network application based on Coco. A first prototype is in development and at the time authoring this paper consists of two core applications: Portfolio Publisher and Portfolio Browser.

Portfolio Publisher

Before considering searching and viewing portfolios over a P2P network, users must be able to create a portfolio to publish to the network. Portfolio Publisher is currently a very simple application — essentially it is an HTML code editor with a preview window. At this stage it was decided to implement a publisher that is very free-form and allows for any kind of portfolio to be created. As many portfolios are currently implemented as Web-based media, it was decided to use HTML as the medium for portfolio publishing. Note that this is mainly for test purposes and throughout the development process; Portfolio Publisher is likely to evolve dramatically. Figure 3 shows a screenshot of the publisher editing window and preview window.

![Figure 3. Screenshot of the P2P Portfolio Publisher application.](image)

When saving a portfolio document, users are presented the opportunity to attach metadata to their document. This metadata forms the basis for what is searched for by users over the network, as the contents of the documents are not parsed. Users specify a list of keywords related to their document and a brief synopsis of themselves. As the document is authored in HTML, links to Web resources can be embedded. Once a portfolio document is saved along with its metadata, it is published onto the P2P network for people to search for and view. At this stage of development, users can only publish a single document each.

Portfolio Browser

The Portfolio Browser application enables the searching for and viewing of portfolios. On starting up, the application handles all the necessary configuration for connecting to the P2P network. Currently, the browser application simply takes a search string and performs a sub-string pattern match with the
metadata available for each file published on the network. The search algorithm utilises wildcard characters to enable less exact searches encouraging more search results. Search results are returned as a list of author names and the personal synopsis metadata. Clicking on the author’s name spawns a window displaying their full portfolio document, as shown in figure 4.

![Figure 4. Screenshot of the P2P Portfolio Browser application.](image)

**Ongoing Development**

The P2P Portfolio prototype is far from complete and work is underway to implement a more complete ePortfolio system.

Rather than working on conforming to any particular standards for ePortfolios, the authors have decided to keep the portfolio as free-form as possible. In order to enhance the user-experience in publishing their portfolio, we propose Wikitext [9] support and rendering as an alternative to HTML publishing. A more advanced document editor similar to word processing software will also be included, but the documents themselves will be stored using Wikitext.

It is also proposed to create portfolio packages which will include a manifest of multimedia resources that can be directly linked to from portfolio documents. By packaging them into one file, a richer portfolio can be retrieved from the P2P network and viewed locally. Linking to Web resources will also be juxtaposed with direct linking to other resources residing on the P2P network.

Mobile devices will also be supported by building on Java and JXTA’s mobile specific counterparts, J2ME [10] and JXME [11].

**Conclusions**

This paper has outlined the rationale for creating decentralised ePortfolio networks. By leveraging peer-to-peer technologies, large scale network services can be created thus being a possible solution to enabling global ePortfolio networks. The P2P Portfolio applications have shown that decentralised ePortfolio network services are possible, and further development is being carried out to create a more advanced portfolio publisher that will be reported on in the near future.
References


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E-PORTFOLIO PASSPORT TO GLOBAL CITIZENSHIP: FOLIO THINKING FOR COLLEGE SENIORS

Dr. Joan E. Leichter Dominick, Kennesaw State University, Dr. M. Leigh Funk, Kennesaw State University, Ms. Bethany Izar, Kennesaw State University

E-Portfolio as Kaleidoscopic Process: Reflective View from Self to Global Society Just as a kaleidoscope needs light to view the endless possibilities of visual combinations of the coloured glass, an e-portfolio provides the illumination for the learner to view the endless possibilities of the potential views and connections of her/his learning experience from self to global society.

Introduction

As part of the Senior-Year Experience Program at Kennesaw State University, an institutional elective capstone course entitled KSU 4401: Senior Seminar was created to assist students in the transition to post-university life. In the course, college seniors create reflective and best of show e-portfolios which helps them to honour, understand, and connect their learning from self to global society. This process is called folio thinking which develops the life-long learning habit of archiving, assessing, and sharing their learning with societal stakeholders in the areas of citizenship, community, and career. We propose that folio thinking acts as a kaleidoscopic process which leads to a deeper view of understanding learning and develops a strategy for archiving, reflecting, and digitally sharing life-long learning for the empowerment of college seniors and their emerging roles as global citizens. The folio thinking process prepares students for life-long continued career development which demands an entrepreneurial approach of managing ones own progress as a knowledge worker in the 21st century. In our presentation we will share the academic approaches to creating e-portfolios as passports to global citizenship by utilizing the folio thinking process for college seniors.

We will share the academic resources we developed to implement the folio thinking process. The academic resources includes the RACCE (Reflect + Assess + Collect + Connect +Express) College Senior Portfolio Process, the Global Portfolio Rubric which integrates the international and global learning outcomes at Kennesaw State University, the e-portfolio formats were developed based on our work, our emerging hypothesis of investigating the learning empowerment developed by creating an e-portfolios and its connection to brain research, and the importance of sharing learning for the betterment of global society. Our folio thinking presentation and resources are posted on the following website so we may share our ideas, resources, welcome your feedback, explore research on e-portfolios and its impact on learning, and begin a dialogue on how to further assist college seniors in the successful transition to post-university life through the design and development of an e-portfolio. Consult: http://www.joandominic.com/ePortfolio2006.html

ePortfolios and Kennesaw State University College Seniors

According to Aristotle, kairos is the legal, political, or ceremonial act that demands a rhetorical outcome for justice. The kairos or ceremonial act of college graduation welcomes the rhetorical act of creating an e-portfolio, which provides the student with self-reflection, transformation, introduction and connection to the audience, which results in an attempt to establish a just, equitable, and sustainable global community. Creating the e-portfolio rhetorically strategizes the use of technology for andragogological transformation and societal connection of the author and audience, resulting in decisions and actions for the better good of global society. E-portfolios will be used as a reflective tool and as an effective means for initiating conversations and actions with others about the value of developing an international perspective and becoming a more responsible global citizen.
We support the critical mission of higher education is to graduate productive global citizens that are dedicated to developing a just, equitable and sustainable society. How did we introduce to the senior-year college students the best practices for developing a global mindset in preparation for their future leadership roles? At Kennesaw State University, we created the Senior-Year Experience Program which assists college seniors in the transition to post-university life by utilizing the folio thinking process as a lifelong learning commitment for using the E-Portfolio as a passport for sharing their learning for the betterment of society. The Senior-Year Experience program consists primarily as an institutional elective course entitled KSU 4401: Senior Seminar which is open to all college seniors preparing for post-university life as a 21st century global citizen. As cited on the Kennesaw State University Senior-Year Experience Website, under mission and vision (consult: http://www.kennesaw.edu/university_studies/sye): The mission of the Senior Year Experience is to provide KSU seniors with an opportunity to reflect on and provide closure to their collegiate educational experience, demonstrate proficiency, develop the skills necessary to successfully transition to and navigate post-university life, understand the civic and social responsibilities of being college educated citizens and connect with KSU in an ongoing relationship.... Students will be able to make connections across courses and disciplines as they articulate the personal and professional meaning of their collegiate educational experience... Students will understand the importance of civic and social responsibility and having a global citizenship perspective... Students will embrace the concept that as college graduates, learning does not commence when they receive their degree, but rather it marks the beginning of a commitment and dedication to life-long learning.

Creating a college senior e-portfolio best supports the mission and learning outcomes of the Senior-Year Experience Program and celebrates the transition to post-university life and the continued process of archiving, reflecting, and sharing life-long learning from self to global society. In 1998, Dr. Joan E. Leichter Dominick, Director Portfolios for Student Success Programs & the Senior-Year Experience Program, introduced the use of portfolios to best assist the college seniors in reflecting on their college learning experience. In 2001, Dr. M. Leigh Funk, Associate Professor of Education, created the seminal e-portfolio training process for the students in Dr. Joan E. Leichter Dominick’s KSU 4401: Senior Seminar. Thus began the academic development of using e-portfolios in the institutional elective capstone course. We collaborated with the Presentation Technology Department in the creation of the desktop publishing e-portfolio entitled PTD Pocket E-Portfolio, the Instructional Technology Department in the creation of the ITS Web Folio, and Career Services in the creation of the Online Career Portfolio which is a password protected Website. In the KSU 4401: Senior Seminar course the folio thinking process includes the design and delivery of a college senior e-portfolio, the technology training to develop the e-portfolios, the reflection the transition from self to global society, and the development of the life-long process of archiving, understanding, and connecting learning to societal stakeholders for the betterment of the world.

As our work relating electronic portfolios progressed, we adopted the term folio thinking from the science learning community portfolios being developed at Stanford University. Also, we were seeking a term to describe the deep process of creating an e-portfolio which included the design, technological development, and the connection to life-long learning. When we referred to creating e-portfolios, sometimes the term caused confusion and discussions of electronic platforms and software ensured. Questions such as what do you mean by e-portfolio? For us, an e-portfolio is the end result of the folio thinking process that is a continual rather than a static process in learning. The idea is to teaching folio thinking as a life-long learning process with the end result being the continual development of e-portfolios for self reflection and beginning conversations to connect in society for citizenship, career, and community.

While in the KSU 4401: Senior Seminar students learn the folio thinking process to produce a reflective and best of show e-portfolios. The reflective or private portfolio promotes self-reflection on the student’s learning as they engage in transformational thinking on global issues. The best of show portfolio is created for public consumption and serves as a platform to spark conversations about how students can make a positive difference in the world. E-portfolios are used as a reflective tool and as an effective means for initiating conversations and actions with others about the value of developing an international perspective and becoming a more responsible global citizen.
The folio thinking process for the College Senior Portfolio has five continual phases of development which help the student design, deliver, and continually assess their learning history and learning plans: Reflect, Assess, Collect, Connect, and Express — RACCE Portfolio Process. By going through these continual phases of development of the College Senior Portfolio the students will have (1) a distinct archived history of learning and plans for their future learning, which results in a Reflective Portfolio/Private Portfolio and (2) have the baseline to design and develop a Best of Show Portfolio/Public Portfolio to present their learning story and learning plans to society for career search, graduate school, community work, entrepreneurial endeavours, and community service.

The Reflective Portfolio includes the following three sections (1) Reflect: Mapping Your College Learning Self-Assessment Instruments (2) Assess: Self-Assessment + Faculty Assessment + Peer Assessment + Stakeholder Assessment, and (3) Collect: Set up Reflective Portfolio Supporting Evidence File which archives both your learning history and incorporates future learning plans.

The Best of Show Portfolio is designed based on information provided from the Reflective Portfolio, which include using the self-assessment learning instruments and the supporting evidence files. There are two phases of the Best of Show Portfolio. (1) Connect: Develop the Mission, Design, and Format of the Best of Show Portfolio, and (2) Express: Present Portfolio to Public. The three phases of planning for the Best of Show Portfolio are deciding on the mission of the portfolio, creating the design of the portfolio, and selecting an effective format for the portfolio.

Once completed Reflective Portfolio and Best of Show Portfolio will help the student honour, understand, and connect their learning for self and for your emerging role as college graduate and global citizen. Part of a international academic movement in higher education, the folio thinking process takes the students learning beyond the college transcript and provides an empowering assessment format for archiving learning, better understanding the breadth and depth of skills and experiences, helps them make better decision about career and the global community.

**RACCE College Senior Portfolio Process Grid**
Reflect + Assess + Collect + Connect + Express
Reflective Portfolio (Private) & Best of Show Portfolio (Public)
[http://edtech.kennesaw.edu/21c/racce.htm](http://edtech.kennesaw.edu/21c/racce.htm)

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<thead>
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<td>Mapping Your College Learning Self-Assessment Instruments</td>
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<td>C</td>
<td>Collect</td>
<td>Collect Evidence of Your Learning</td>
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<td>Set up a Reflective Portfolio File</td>
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<td>C</td>
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<td>Develop the Mission, Design, and Format Portfolio</td>
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ePortfolios and Global Citizenship

We believe that the folio thinking process provides a “way of knowing” and better understanding of the qualities of a global citizen. The authors of this presentation have taken a leadership role at the university in the areas of integrating international and global learning from the classroom to university wide assessment initiatives. This past academic spring 2005, Dr. Joan E. Leichter Dominicke served on the Quality Enhancement Plan Steering Committee (QEP). The Quality Enhancement Plan, which is the five year university plan to triangulate its mission, is part of the SACS Review of 2006. Her committee proposed a QEP plan with an international and global learning prospective. The end result is a five year QEP entitled Global learning for the engaged citizen. We have integrated the international and global learning outcomes in the folio thinking process by developing the Global RACCCE College Portfolio Rubric used by the college seniors when creating their e-portfolios. This rubric takes the RACCCE College Portfolio Process and integrates it with the Kennesaw State University International and Global Learning Outcomes. Dr. Dan Paracka, Director of the Office of International Services and Programs, was instrumental in providing guidance in the creation of this rubric. He also co-teaches with Dr. Joan E. Leichter Dominicke. Ms. Bethanie Izar, one of the authors of this paper, as a student in KSU 4401: Senior Seminar created an e-portfolio with a focus on global citizenship in Spring 2003. Her e-portfolio inspired special section offerings of KSU 4401: Senior Seminar bringing together international students, exchange students, and students that had studied abroad to come together to create their e-portfolios and reflect on what if meant to be a global citizen. Ms. Bethanie Izar continues to update her e-portfolio and share it with my current students. She currently works at the university in the Alumni Association. Ms. Bethanie Izar does presentations for the college seniors in the KSU 4401: Senior Seminar and lectures on the importance of the folio thinking process. She is an exemplary example of the learning power of the folio thinking process. Here is the link to Ms. Bethanie Izar’s e-portfolio and her reflection on the process of folio thinking which are quoted in her portfolio: http://www.eport2passport.com/pdf/BethanieIzar.pdf

When I started my e-portfolio project I was thrilled that the fact that I am a pack rat would finally payoff. Throughout my life I have kept all things that have sentimental, educational, and professional meaning to me. This included old birthday cards, term papers, business cards, and every letter that was written to me acknowledging my achievements. Some may call this going to far, others may even think it is egotistical; however, I call it organized. You can imagine my gratification when I enrolled in the senior seminar class and found out that I would be rewarded on my organization skills, by compiling my college history into a physical portfolio and later an e-portfolio.

As I began to compile my experiences and achievements, it only then sunk in how different of a life I am growing up in compared to past generations. During the course of my undergraduate degree I was able to study abroad in five countries. This was made possible through scholarships, part-time jobs, a strict Ramon Noodle diet, but more importantly, international education advocates. These advocates in universities and organizations around the world have recognized the valuable lessons that reaching past one’s comfort zone can offer. While studying abroad is not a new phenomenon, it is however, becoming increasingly accessible. This is the factor that has caused a shift in the education of present and future generation’s, accessibility to the world.

So since the world is truly becoming our “oyster.” What are we doing with it? As more and more students begin to embark on their international opportunities, e-portfolios become a way to intertwine the international skills that one acquires with the necessary technological skills that employers are looking for. Furthermore, an e-portfolio begins to address the issues of building off one’s international experience. Soon, I hope to see the practice of simply listing your international experience on a resume replaced with an e-portfolio displaying a student’s efforts in building off such experiences and incorporating what they learned abroad into the everyday personal and business interactions that they carryout in the future.
In conclusion, here are some resources relating to ePortfolios and Global Citizenship that we have created:

Global RACCE College Portfolio Rubric:
Integrating Kennesaw State University International Learning Initiatives: *Global Learning for the Engaged Citizen*
http://www.eport2passport.com/Global_Portfolio_Rubric.htm

E-Portfolio: Passport to Global Citizenship:
Authors: Dr. Joan E. Leichter Dominick, Ms. M. Leigh Funk,
        Dr. Dan Paracka, Mr. Ben Cope, & Ms. Jennifer Leifheit 2004.
        http://www.eport2passport.com

E-Portfolio: Passport to Global Citizenship- Resources:
Resources for the design & delivery of the college e-portfolio
http://www.eport2passport.com/resources.html

E-Portfolio Passport to Global Citizenship: KSU & World Wide
International Learning Resources:
http://www.eport2passport.com/AAHE/bookmark.doc
ePortfolios and Research on *Folio Thinking* + Life-Long Learning + The Brain

In conclusion, the authors of this presentation would like to invite participants interested in researching the connection between the *folio thinking process* and its subsequent impact on the life-long learning process. We hypothesize that the act of *folio thinking* is a transformational learning experience which deeply engages the learner in a kaleidoscopic self-view which results in significant growth in areas from academic expertise to embracing the qualities of a global citizen.

The conceptual framework for this presentation is grounded in observations made in our professional practice, research from learning theorists, neuroscientists, electronic portfolio experts, and calls for national research collaboration. This presentation seeks to initiate an interdisciplinary conversation among professionals interested in the areas of neuroscience, learning and the brain, electronic portfolios, and innovative approaches to assessment.

*Portfolios offer rich possibilities for learning and assessment. With increased pressure for better understanding of college and university students’ learning and external pressure for better representation of it, portfolios enable learning for the creator and the user and demonstrate learning for multiple audiences (Cambridge 2001, p.1).*

The term *folio thinking* which seeks to better understand students’ learning from a biological perspective as well as leverage electronic portfolios as a strategy to maximize learning and assess the application of that learning. Throughout our experience using electronic portfolios with graduate and undergraduate students, we began to observe that the development of electronic portfolios had a powerful impact on students. Students were highly motivated to participate in the development of the portfolio, and they remained intensely engaged in the learning process as they developed and presented their learning. Upon the review of the portfolio development process and the learning cycle, we realized there was a strong connection between Kolb’s experiential learning cycle and the portfolio development process as shown in Figure 1.

![Connection between the Life-Long Learning Cycle of College Seniors and the Electronic Portfolio Development Process](image)

**Figure 1.** Connection between the Life-Long Learning Cycle of College Seniors and the Electronic Portfolio Development Process.

The learning cycle is an extension of David Kolb’s experiential learning theory which further extended research from learning theorists such as Dewey, Piaget, and Lewin (Kolb, 1983). When more closely reviewing how the learning cycle is connected to the biological processes of the brain, it became clear that the “learning cycle arises naturally from the structure of the brain” (Zull, 2001, p. 19). The triangulation of the biological learning process, the learning cycle and electronic portfolio
development process is conceptualized in the following if/then statement: If the learning cycle supports the biological process of learning within the brain, and the electronic portfolio development process aligns with the learning cycle, then the electronic portfolio development process must also support the biological process of learning within the brain.

For example, we know that in order to transfer information from the working memory into the long-term memory, the brain needs to continually reprocess the information (Sousa, 2006). Electronic portfolios encourage elaborative rehearsal enabling students to “associate new learnings with prior learning to detect relationships” (2006, p. 87). When students work through the process of developing an electronic portfolio student learning tends to be “richer, more lasting, and more transformative” (Zubizarreta, 2004, p. 47). If our emerging theory is correct, the use of electronic portfolios may in fact be a way to better understand and represent student learning (Cambridge, 2001) from a biological perspective thus holding significant implications for how we assess student learning in the 21st century.

With the advancement of new technology, scientists have gained new insights into how the brain works. Neuroscientists are closer than ever before to being able to biologically identify the abstract processes involved in human emotion, thinking and ultimately of learning (Zull, 2002; Sousa, 2006). Although educators have been interested in the connection between the brain and learning, neuroscientists and biologists showed little interest in the implications their research held for education or assessment of learning. Until recently, “educators were largely left to interpret neuroscience on their own” (Zull, 2001, p. xiii). Within the past few years, more literature is being published on the learning brain and the implications of understanding both the biology of learning and strategies to better educate the learning brain.

In an effort to extend interdisciplinary research relating to the learning brain and the potential implications for authentic assessment practices such as electronic portfolios, this presentation invites interested parties to begin discussions on current research, theories, resources, or potential collaborations. The National Science Foundation and the National Coalition for Electronic Portfolio Research are calling for interdisciplinary research initiatives (National Science Foundation, 2006; National Coalition for Electronic Portfolio Research, 2006). We believe participants attending this conference are uniquely poised to engage in these discussions and to move the field of brain research, electronic portfolios and assessment forward to a greater understanding of the power of the folio thinking process.
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11. COLLEGE STUDENT E-PORTFOLIO INITIATIVES WITH PRESENTATION TECHNOLOGY DEPARTMENT: HTTP://PTD.KENNESAW.EDU/EPORTFOLIO/


15. DR. JOAN E. LEICHTER DOMINICK : HTTP://WWW.JOANDOMINICK.COM


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1. Theme and issues addressed:

Theme#1: Policies

- Celebrating cultural identity – how can ePortfolios support and celebrate the cultural diversity of individuals and territories?
- Social Inclusion – what evidence do we have that ePortfolios are making a contribution to broadening opportunities and social inclusion?
- Digital divide – how can ePortfolios help reduce the digital divide?

2. Title: *Window to Student Experiences – ePortfolio for ESL Students’ Digital Stories*

Preferred mode of presentation: Good practice case study – User testimony

3. Doubleday, Dale and Meyers, Nancy and Colan, Cheryl
Phoenix College, Phoenix, Arizona U.S.A.

4. Background or context

This ePortfolio pilot project took place at Phoenix College, which is one of the Maricopa County Community Colleges located in Phoenix, Arizona. The project was funded through a Teaching and Learning Grant in 2005-2006. The focus of the project was to create an ESL Learning Cooperative for ESL 040 (Level 4 Grammar for ESL Students) and ESL 041 (Level 4 Listening and Speaking for ESL Students) by combining two ESL courses and a digital storytelling course into a learning community (providing a co-curriculum) that allowed each student to develop a final project: a digital story called “The U.S. Journey.” This method of digital storytelling provided for student self expression, cultural validation and content connection between grammar and listening/speaking classes by incorporating meaningful and authentic learning. By developing the curriculum around this semester-long theme, students had the opportunity to experience more coherently integrated vocabulary, a variety of learning modes and methods and first hand experience with technology and personal expression. During the project, faculty and students collaborated on authoring an ePortfolio to document the project and showcase student stories. The ePortfolio was available for student and faculty use beyond the scope of the project.

Objectives

For this project, Level 4 ESL curriculum was restructured for the ESL Learning Cooperative by introducing a thematic approach in order to make a stronger link between grammar (ESL040) and listening and speaking (ESL041) courses and technology. ESL and Digital Storytelling competencies were enhanced by deepening the application of skills to authentic language experiences. The students focused on the general theme of “The U.S. Journey” during the semester. A framework including syllabi, units, activities and assignments in grammar and listening and speaking were developed and coordinated around this theme. In addition, by focusing on a theme that all ESL students have experienced and can relate to, students were motivated to express themselves in writing and speaking about a meaningful topic.

Digital storytelling was introduced to Level 4 ESL students. The student project for the ESL Learning Cooperative focused on the creation of two digital stories including a student generated script and storyboard that demonstrated strong grammar, speaking and technology skills. Students edited and produced two short personal digital stories, one on an object or place from
their culture and the other about their journey to the United States. They then archived the story for computer display and video output and presented the digital story for peer review.

Through the ESL Cooperative ePortfolio, digital stories and course materials were shared with ESL instructors. The ePortfolio is a cooperative effort of all project instructors and support personnel. In this way, methods, techniques and results of this project's strengths were communicated to ESL faculty to provide the tools necessary to integrate digital storytelling as a viable active learning mode of instruction. The ePortfolio is also available to all Phoenix College for staff training. A separate ePortfolio is currently being developed for general viewing so that students’ classmates, family and friends can access their digital stories.

Objectives:
Restructuring the Level 4 Curriculum:
*Develop syllabi, curricular materials and assignments for ESL040 and ESL 041 based on a unified theme.
*Incorporate unified theme throughout each collaborated unit.

Introducing Digital Storytelling:
*Develop instructional materials on digital storytelling for Level 4 ESL students
*Develop student materials in the form of a publication on digital storytelling for Level 4 ESL students
*Collaborate with art department faculty to facilitate student instruction in digital storytelling software and web research
*Schedule lab sessions with ESL students and digital storytelling specialist
*Learn software to be used in digital storytelling in order to coteach with digital storytelling specialist, Dale Doubleday
*Create a library of sample photos from various countries for student use.
*Facilitate the creation of two digital stories per student

Sharing the ESL Learning Cooperative Materials with ESL instructors:
*Using the Maricopa ePort tool, create the ESL Learning Cooperative and Digital Storytelling Project ePortfolio site, which will chronicle the project and showcase student work
*Create ESL Learning Cooperative CD-ROM/notebook which will provide ESL instructors, including adjunct teachers, with integrated ESL040/041 assignments and classroom tested teaching techniques
*Create a DVD of student stories to use in promoting digital storytelling into other ESL courses
*Train ESL instructors on use of materials

Summary of results

The results of the pilot project can best be summarized by viewing the student digital story projects and student comments on the ePortfolio. http://eport.maricopa.edu/published/d/st/dstory/home/1/

Students had the opportunity to display and celebrate their personal and cultural experiences through their digital stories. Each student produced two stories documented on the ePortfolio.

Showcasing of the project process and the digital stories in an ePortfolio will result in discussion with both college faculty and students. Project faculty have received emails expressing empathy for the project, and gratitude to the project’s students for sharing their experiences through their stories, thereby broadening their understanding and acceptance of ESL students.

This project helped to reduce the digital divide by introducing the ESL students to technology that they had no previous experience with. For some ESL students in our pilot group, working on the digital story was the first time they had the opportunity to work on computers, use digital cameras, use video editing software and work on an ePortfolio.
Conclusions and recommendations

The conclusion is that ESL students clearly benefited in the area of English language acquisition and technology skills through their participation in the ESL Learning Cooperative using eStrategies. In addition to these quantifiable skills, students also were empowered to reflect on their own experience and culture. Marginalized populations, such as refugees and immigrants, do not have a voice in their everyday interactions at school, at work, and in their community. Digital stories provide an avenue for students to share their life changing experiences. Also, the students made connections with their classmates in new ways by sharing their stories with each other. For the first time, many had the opportunity to chronicle their personal, cultural and immigrant experiences in a lasting media.

The conclusion is also that the project documentation ePortfolio has been beneficial to Phoenix College and Maricopa County Community Colleges ESL faculty and students by allowing others to share and learn from the process. It is recommend that this project be continued with ESL040 and ESL041, with process and outcomes documented on the ePortfolio. Other recommendations include the creation of an additional ePortfolio site to showcase the student digital stories in more of a presentation format, along with other digital stories from Phoenix College, to act as a showcase of student work and as a gateway to Phoenix College.

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DEVELOPMENT OF A PEDAGOGICAL MODEL FOR EPORTFOLIOS – THE SHAPES OF THINGS TO COME?

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Background and Context

The Individualised Support for Learning through ePortfolios (ISLE) Project is funded by the Scottish Funding Council as one of 6 national projects funded under the e-Learning Transformation initiative. The programme is managed by the JISC programme team.

The generic aims of the project are to:

- build foundations for transforming staff perceptions of Personal Development Planning (PDP)
- build a sustainable future for effective learning
- develop and nurture a culture of strong staff commitment combined with a genuine conviction that PDP is a worthwhile process for students to take part in.

The project addresses a need identified amongst the partner institutions and from analysis of work on other related projects through CRA, for more timely and tailored support to meet individual learner needs, and more effective mechanisms to link up the various sources of support for learners made available at the FE and HE stages of learning. It also provides a framework in which to build learner confidence, aspirations and achievement by providing better quality feedback and appropriate and timely further support. The project seeks to address three core problems:

- Under-performance of learners - improving learner progression, retention and achievement, and enhance employability
- Meeting the diverse needs and rising expectations of learners (and lifelong learning) within the context of continued pressure to reduce costs
- Realising a seamless transition model that meets stakeholder expectations for efficiency, quality, sustainability and transferability to different institutional contexts.

The project also has a number of strategic objectives, including to:

- establish and demonstrate the effectiveness of a common pedagogical framework of practice across the partner institutions grounded in a shared concept of PDP
- realise tangible benefits for learners in terms of effective learning, increased skills, self-awareness and employment prospects
- identify, develop and deliver support and training for staff and students collaboratively to facilitate effective use of the ePortfolio framework.

There is growing evidence (CRA) of the pedagogical benefits of an ePortfolio approach to effective learning and that learners, in particular, value such tools to support PDP and to join up different aspects of their learning experience. The project builds on this by specifically linking PDP, on-line diagnostic tools and integration to other online resources to support effective learning and transition between stages of learning.

The ISLE project is unique in the way in which it proposes to move the concept of PDP forward to a new level through the integration of the various blended learning tools (e.g. VLEs, ePortfolios, and diagnostic assessment tools) and by the way in which it will develop as an individualised, self-reflective learning environment for students. It differs substantially from previous ePortfolio projects by putting the emphasis not on technological solutions but on how to get the necessary pedagogical transformations so that learners meaningfully benefit through the effective deployment of technology to support the learning process.
The Project Model

The project is fundamentally built on three basic concepts which lead to an integrated model for effective learning for students. The three concepts are:

- Personal Development Planning
- ePortfolios
- Pedagogical Underpinning

Personal Development Planning

The project team has adopted a widely-accepted definition of PDP as ‘a structured and supported process undertaken by an individual to reflect upon their own learning and/or achievement and to plan for their personal, education and career development’ (Universities UK, 2002).

Fundamentally, PDP is a process much more that it is a product, even though students usually produce a product of some form (e.g. paper or e-based portfolio or CV, etc). The process which is both iterative and integrative consists of:

- goal setting and “action” planning
- doing (learning through the experience of doing with greater awareness)
- recording thoughts, ideas, experiences, evidence of learning
- reviewing (reflections on what has happened, making sense of it all)
- evaluating (making judgements about self and own work and determining what needs to be done to develop/improve/move on).

Additionally, there is agreement within the ISLE consortium that if the process of PDP is to become an integral part of the curriculum, a number of fundamental constructs need to be accepted by staff and students for example:

- the process needs to be underpinned by institutional strategies, especially for teaching, learning and assessment and student support, and at the programme level through adaptation of the model to fit a particular subject ethos
- the process needs to be learner-centred, supportive of a wide-range of different learning styles – it needs to represent (or at least parallel) the student’s own personal learning journey
- the main outcome from such processes in terms of personal development will likely be a significant contribution to students becoming independent, autonomous, self-aware learners
- the processes should be relevant to students at all stages in their studies in higher education and employment and link to previous development in schools and further education.

ePortfolios

An ePortfolio can be variously defined, but for the purpose of this project it is understood as an electronic tool capable of supporting personal development planning (PDP), including an electronic archive, opportunities for diagnostic testing and interactive learning, feedback and support, and facilities to manipulate and present outputs, such as curriculum vitae. As such, it is not just a repository for recording activities but an integral part of the basic pedagogical model underpinning the project and providing a virtual environment in which the goal of empowered, self-directed, reflective learning can be nurtured.

Both within the UK and internationally there is considerable research into the development of the ‘ePortfolio’ concept and much previous variety in concept. A significant number of US institutions are now deploying ePortfolios to allow students to record their learning and present their achievements. Of more immediate relevance to ISLE are those projects in the UK working within the contexts of PDP, a learner centred pedagogy, embedding skills in the curriculum and employability. Those at Nottingham University (PADSHE), Liverpool University (LUSID), Wolverhampton University (PebblePAD) and Dundee University
Siemens (2004) argues that five levels of functional requirement exist for ePortfolios, with increasing institutional and cross-institutional embedding. The ISLE project model of an ePortfolio is rooted in Levels 4 and 5 in which the ePortfolio developed by students is integrated into institutional systems and services for learning, assessment and personal development, conforms to open standards, is transferable and interoperable at least within an institution and potentially across institutions.

**Pedagogical Underpinning**

The ISLE Project uses a basic definition of learning as “a fluid mixture of experience, values, contextualised information and insight that provides a framework for evaluating and incorporating new experiences and information” (Davenport, et al. 2000). This definition combines different sorts of knowledge and understanding in ways that enable learners to acquire, create, make sense of and use new knowledge.

The past 20 years have seen big changes in the structure, function and financing of tertiary education. Widening student access has radically changed the profile of new entrants. Classes today are not only larger, but contain a much greater diversity of learner ages, maturity, backgrounds and capacity to learn. This has also led to a much wider spectrum of entry-level skills and attributes. Therefore, the modern learning environment is extremely complex and managing the learning process in such an environment, requires strategies which utilise some of the principles of so-called complexity theory (Stacey, et al. 2000).

The learning process in itself is often a key agent of change as students gain confidence in their knowledge and skills and recognise or search out opportunities for personal, community or career development.

The “modern” learning environment can be assumed as originating in a dependent environment in early stages, based on knowledge and understanding of the discipline. Tertiary education curricula are fundamentally concerned with this type of knowledge, and assessment processes test its acquisition and use through a range of methods that reflect the way knowledge is produced in the subject. In a course’s later stages, e.g. Honour’s year of an undergraduate programme, students should reach an independent stage of learning based on skills of application, analysis, synthesis and evaluation, and in a trans-disciplinary way.

Therefore, increasingly, students are being required to become autonomous in their learning, skilled in a multi-disciplinary/cross-disciplinary range of skills and to become interdependent in these in order to become a marketable and employable asset in skills such as taking initiative, leadership, working in teams, collaborating and planning and their own careers.

The world that most of our students will inhabit for most of their working lives requires capacity and understanding for working with many different sorts of knowledge in order to engage with complex emergent problems for which there may be a range of possible solutions (Eraut, 1994), including the concept of “meta-learning” (Biggs, 1985). Knowing what and how to learn the next thing is just as important as what has already been learnt.

Constructive alignment principles such as those of Biggs (2003), are also fundamental to the ISLE pedagogical model. In essence if we have a student with already well-founded learning skills, confidence, enthusiasm and motivation and a student with low motivation, poor learning skills and little confidence, then the gap between their performance will be greater the more the passive nature of teaching. Conversely, the more we engage the students in active learning, that is engaging students in seminar discussions, using interactive formative feedback techniques, etc, the smaller the gap will be and the less-able students will be more likely to succeed.

**The Complete Model**

The pedagogical model underwent further development in the early stages of the project through consideration of a number of other PDP/Employability related models such as the key skills and autonomous learning strands of the Scottish Credit & Qualifications Framework (SCQF) and the USEM theory of employability (Knight and Yorke, 2003).
The concept of the ISLE pedagogical model is based on the model developed by the Effective Learning Project team (ELF, 2006) which produced a model designed to make the implementation of PDP a more relevant and achievable prospect in Scottish tertiary education. This group, which a number of the key ISLE project staff were involved in, is based on the principle that PDP is just one of many processes embedded within a general framework of learning, teaching and assessment strategies, careers information and guidance, and learners personal aspirations and experiences – this is known as the Effective Learning Framework. The model encourages institutions to consider the holistic aspects of the student learning experience and how these should be linked, in terms of (a) the institution directly supporting the student’s learning experience, e.g. by encouraging academic staff to work more closely with careers staff and (b) how the student integrates their internal learning experience, e.g. by being able to relate what they have learned to their range of employability and transferable skills, through a series of Focused Learner Questions (FLQs).

At the core is a self-audit process for students, set within the context of an overall student learning experience represented by considering the three fundamental aspects of academic curriculum, career aspirations and personal experience as a set of interlinked “spheres” of activity and experiences. Additionally, the model is not static but will dynamically “change” at various points during the student lifecycle, with the relative importance (“size”) of each sphere and the way in which they integrate (amount of “overlap”) with each other varying according to a number of factors including the stage of the programme of study reached, nature of particular subjects, the nature of a particular learning experience and student maturity and development.

![Figure 1 The three fundamental aspects of activity and experience.](image)

The intersections of the three spheres represent the integration of joint learning areas and the focus of Self-Audit. Such an audit will be achieved by students through a framework of questions – Focused Learner Questions (FLQs) which are student-based and Generic Questions which are Institution based. The link between the “generic” and “focussed learner” questions is based on the concept that Institutions can define their core mission statements and strategies, the student’s main subject area of study can define the context for learning and the students themselves define their intentions through ePDP.

**Methodology**

The project methodology is structured around a series of tightly focussed work packages, each coordinated by a partner institution, and integrated into the overall programme of work. The overall emphasis is on engaging staff at the local level and involving each partner in the delivery of the project in line with their strategic priorities and specific strengths. The overall work of the project is centred around pedagogical, technical and operational issues and these are built into the work packages as required.

The basic evaluation strategy calls for pre and post analyses of student and staff responses to their engagement in the pilot work packages in Phase 1 (to September 2006) and Phase 2 (to April 2007). This is being done through, Pre and Post questionnaires for staff and students,
tutor logs, i.e. staff doing their own PDP, and PDP Practice summaries, student focus groups, staff interviews and development workshops.

An intervention study like ISLE depends upon the impact of the intervention at different levels of the system from the institutional and management level to the academic and support staff who are at the front line in implementing the changes to the students who are in receipt of the changes. A key evaluation aspect is the assessment to what extent the constructs embed into the institution at these different levels. From the many different possible sources of data, it was decided that the evaluation in Phase 1 should focus on collecting data at four different levels of students, staff, University managers and Institutional strategies.

To establish the extent to which the ISLE project is successful in raising awareness of PDP and ePortfolios and changing practice in their use, the evaluation work package collected baseline data at these different levels in the system at the start of the ISLE project. Consequently the basic design of the study was a before/after design where some measures were taken prior to participation in ISLE and then again following participation in the project.

Discussion

The ISLE project represents a significant challenge from the point of the very large geographical spread of the partners and particularly the wide spread of missions, student type, staff experience and technological resourcing. The scale of this diversity was not fully appreciated at the project planning stage and has resulted in difficulties in developing a reasonably common integrated strategic development approach. There have also been difficulties in establishing a credible move forward in the concept of “transformation”, particularly with regard to measurable improvements in progression or retention. This is due to the short timescale of the project and the realisation that any measurable increases would not necessarily be attributable to the benefits accrued by implementing the ISLE model.

After the first year of the project, it can be concluded from questionnaires, workshops and focus groups, that the partners have the same understanding of PDP as an empowering, self-reflective pedagogical model. There is evidence of:

- Increased confidence in PDP but not in ePortfolios – this is likely due to unfamiliarity with the technology in both staff and students
- Attitudes to benefits of PDP/ePortfolios are less positive than anticipated in both staff and students – this is likely due to expectations set too high
- Attitudes to negative aspects pre-and post Phase 1 did not noticeably change – possibly indicating insufficient experience during the pilot phase or that staff and students believe that it is a positive intervention overall.

In our Phase 1 evaluation of the project from an institutional management perspective, a number of respondents voiced the opinion that ISLE will benefit their institution because it is likely to help tackle issues and support ideas already proposed or about to be included in strategic plans, as well as ideas already/about to be implemented in some format, e.g. wider access and participation, e-learning, student-centred learning, reflection etc. ISLE was regarded as in tune with broad pre-existing issues in FE and HE such as quality enhancement and the effective learning framework (ELF) and was seen as a mechanism for helping to implement pre-existing institutional strategies. One of the recognised benefits of ISLE was that it would help institutions to become more collaborative and more aware of developments elsewhere which would help avoid repeating mistakes and overlooking existing work.

Another important recognised benefit of ISLE was that it would lead to examples of effective practice for PDP. Examples are emerging from the PDP Practice Summaries completed by the tutors involved in implementation activities.

Respondents were generally positive that ISLE would lead to improved student achievement. The current results suggest that despite their lack of familiarity with these constructs, the students do have a basic understanding of these main features of PDP and ePortfolios. Students were less certain that PDP and ePortfolios would “change the way I learn” or “change the way I interact with staff”. This suggests that from their current understanding students did not agree with or found it difficult to evaluate these features of the tools.
Conclusions

This study covers the work of an exciting cross-sector project into the development and implementation of an ePortfolio based reflective, empowering and individualised effective learning model for students. All partners have made substantial progress so far in adopting the pedagogical model to their own institutional circumstances.

Students confirmed that they had significantly more experience of PDP, ePortfolios and diagnostic testing after participating in the ISLE project. This experience gave them more confidence in explaining ePortfolios and diagnostic testing. Students’ attitudes to the benefits of PDP and ePortfolios were less positive following participation in the ISLE project, although attitudes to the negative features of these tools did not change.

The second phase of implementation will further test the model on students and staff and will look for acceptance of fundamental constructs.

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TITLE
PLANNING AND IMPLEMENTING AN INSTITUTIONAL STAFF DEVELOPMENT PROGRAMME IN EPORTFOLIOS

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Introduction
This ‘work-in-progress’ report provides an overview of current research into staff development and ePortfolios. It presents key themes, which have been identified through a literature review and from 15 semi-structured interviews conducted with staff developers and tutors using an ePortfolio in the United Kingdom, the United Stated and New Zealand during 2005 and 2006.

The literature review
A search of electronic databases and e-journals using key words such as ePortfolio, electronic portfolio and personal learning plan was conducted. Websites for the Centre for Recording Achievements, the Higher Education Academy and Helen Barrett’s personal website were also searched for relevant literature. Fifty articles on the subject of using portfolios, including ePortfolios, for learning and personal development were reviewed.

The interviews
A number of staff developers, both nationally and internationally, were identified as having significant experience in developing, implementing and/or using an ePortfolio. A total of fifteen staff developers agreed to be interviewed, twelve from higher education and three from further education, who completed and returned a consent form. All fifteen volunteers were interviewed either by telephone, video conference or by face-to-face interview. Where possible interviews were recorded and a written transcript produced. Two of the twelve recordings were lost due to a faulty recorder. Where interviews were not recorded, notes were taken at the time of the interview. The questions used for the interviews were developed from the themes identified in the literature and were sent to each interviewee prior to the interview. Approval for each transcript was sought as each interviewee received a preview of his/her own transcript.

Initial findings
No clear models, examples of good practice and/or guidelines have emerged regarding staff development and eportfolios to date. Therefore, we suggest, at this stage, that each institution addresses the following areas in their staff development programme for ePortfolios which have consistently emerged through the literature review and the interviews. Inevitably, the amount, type and focus of the staff development programme provided will reflect the strategic approach of each institution and the resources available.
Areas for consideration:

- **clarification of terminology**
  Terms such as progress file, personal development plan (PDP), portfolio and learning log are commonly used when referring to a process of developing, storing and maintaining a record of personal learning development. In addition, webfolio and electronic portfolio (ePortfolio) are used when referring to an electronic system that supports the development and use of a portfolio although a difference of opinion exists in the literature about the determinants of each. Prior to any staff development, it is essential that an institution has clarity and consistency about the terminology to be used surrounding the ePortfolio and that this is reinforced in strategic documentation. It is also recommended that institutions make staff aware of the lack of consistency in terminology between the further and higher education sectors in the United Kingdom to ease learners’ transition from one institution to another.

- **institutional understanding of the purpose of an ePortfolio**
  An ePortfolio system has the potential to fulfil many functions. It can be used as an interactive learning tool providing a forum for learners to engage in dialogue and to exchange personal learning experiences. It can store and display artefacts as evidence of learning achievements and experiences (Siemens 2004; Lorenzo and Itlleson 2005) and can be used to support personal and/or professional development (Funk 2004). Roberts et al’s (2005) idea that an ePortfolio should be more than a digital repository used to store files of personal achievements but should also support the development of reflective active documents for lifelong learning is generally well accepted throughout academia (East 2005; Barrett 2000).

  Prior to any staff development programme, there must be understanding about the type, level and purpose of use of the ePortfolio system. Staff should be provided with good examples of practice, for example, how blogging could be used to support deep learning. If at all possible, staff should be provided with opportunities to use the ePortfolio for themselves to experience this new online environment.

  It is also recommended that any staff development outlines the advantages of an ePortfolio over a paper-based system. Some staff may be familiar with a paper-based system and perceive that an ePortfolio is just an online version and miss the added functionality and opportunities within an ePortfolio. Therefore, it is essential that tutors have the possibility of exploring the role of the ePortfolio as both a digital archive and as a tool for promoting lifelong learning.

- **a debate about assessment and ePortfolios**
  There is on-going discussion about assessment and ePortfolios: some favour assessment as a means of capturing valuable material developed from a process of learning. However, Barrett (2004) opinions that using portfolios for assessment will influence how learners use the portfolio and that it will change from a tool that can support lifelong learning to a ‘high stakes’ document that will be judged against a set of prescribed learning objectives. This area may be the most problematic for academic staff in tertiary education since no assessment will require tutors to ‘let go’ of the learning process and accept that not all learning needs to be evaluated, measured or judged.

- **further staff training in reflection**
  Although there is little evidence that reflection can promote lifelong learning, there is general agreement that reflection should be used to evidence learning activity in the ePortfolio. Again, an institution needs to clarify the role that reflection will take in its ePortfolio. However, any staff development programme will need to accommodate tutors’ present knowledge and attitudes to using reflection in learning and teaching. It cannot be assumed that all staff and learners will automatically possess the ability to be reflective learners and tutors will need
guidance on how to support learners think and write in a reflective way. Examples can be drawn from teacher education.

- **consideration of the legal issues surrounding ePortfolios**
Charlesworth and Home (n.d.) present legal issues to be addressed when working with Managed Learning Environments which may also be applicable to ePortfolios such as ownership and Intellectual Property Rights of the materials contained in the ePortfolio. An institution needs to have clear policies to encourage good practice when using an ePortfolio tool to reduce infringement of copyright law, of the Data Protection Act and to reduce libellous practice (Charlesworth and Home 2004). For example, staff and students need guidelines on the use of blogs. Staff also need to make students aware of how their postings may be misinterpreted and the potential consequences. It may be appropriate to remind staff and students of their institution’s Information Technology Acceptable Use Policy and to provide examples of when a blog may be infringing these.

Additional issues that should also be considered in the preparation of a staff development programme include:

- **Technical training**
Tutors will require some technical training in the use of any ePortfolio system. The challenge for any staff development programme will be to provide adequate and timely technical support with appropriate reference documentation. Also, like many institutions have encountered through their institutional deployment of a VLE, some tutors will focus on the ‘how’ of the system rather than the ‘why’ of using the system especially if the tutor is already experienced in using a paper-based portfolio.

- **The role of support staff**
Support staff including careers, disability officers, Information Technology and student support staff all have a vital role to play in the deployment of an ePortfolio. Such staff may wish to provide guidance to tutors on reflection, employability and diagnostic testing in relation to the ePortfolio. The Disability Officer could offer guidance on problems encountered by special needs students using an ePortfolio.

- **Storage and transferability**
Consideration and plans for the storage, archiving and/or transferability of ePortfolio content is required particularly if learners are transferring within the tertiary sector. Tutors will need to know what students can transfer, how it can be transferred and in what formats.

Inevitably, the amount, type and focus of the staff development programme provided will reflect the strategic approach of each institution and the resources available. In many cases, it may be appropriate, as Barrett (2000) suggests, to focus staff development programmes on a small group of enthusiasts. Then this group can be used to help in cascading learning throughout the institution. Nevertheless, this staff development must grapple with the issue of staff buy-in to support learners using the ePortfolio.

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E-PORTFOLIO AS A COACHING SUPPORT TOOL FOR WORKPLACE LEARNING OF TEACHERS

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Abstract

This paper presents the results of a pilot conducted by the Ruud de Moor Centre for the Professionalisation of Teachers, Open University Netherlands. The pilot investigated the possibilities of using the electronic portfolio as a tool for learning and coaching in the workplace. Beginning teachers who receive the teacher education in the workplace, the so-called career-switchers, were stimulated to construct electronic teaching portfolios and use them in communication with their workplace coaches. Several scenarios of use were observed: the e-portfolio served to structure the coaching process, to help the coach prepare for coaching sessions and to deepen coaching. The pilot demonstrated that the electronic portfolio enlarges the coaching repertoire and increases perceived efficiency and effectiveness of coaching in the workplace.

1. Introduction

This experience report paper presents the results of a five-month long pilot conducted in 2005 by the Ruud de Moor Centre for the Professionalisation of Teachers (RdMC). The pilot investigated the possibilities of the e-portfolio as a tool for workplace coaching of new entrants in the teaching profession, the so-called career-switchers.

Introduced in 2000 as a measure to combat shortages of teachers in all sectors of education, career switching to the teacher profession has become a legitimate alternative to preservice teacher education in the Netherlands (Ten Dam & Blom, 2005). Entrants in the teacher profession can be granted employment as a teacher upon the results of an assessment of motivation, relevant skills and subject matter knowledge and have to obtain the required teacher qualifications within two years. The institutes of higher teacher education offer career-switchers fast-track training programmes while the essential practical training takes place in the workplace and is supported by workplace coaches and supervisors (OECD, 2003).

In preservice teacher education workplace learning plays an important role in training and fine-tuning of pedagogical, communicative and organizational teacher skills. Daily classroom practice contributes to shaping, enriching and verifying learning and teaching beliefs of student teachers. As such it is recognised in most teacher education curricula. However, institutes of higher education still occupy the central place in preservice teacher education. Furthermore, within most regular curricula of teacher education theoretical and practical training usually precedes the actual confrontation of the student teachers with the reality of school practice.

In the context of teacher education of career-switchers the confrontation with the classroom practice comes first. These new entrants in the teaching profession miss the general pedagogical background and reflective skills that constitute the core of the teacher competence (Zeichner & Wray, 2001). The general turbulence of school as a working environment, however, leaves little space for processing new experiences, for deeper analysis and reflection indispensable for the development of a new professional identity (Bolhuis, Imants & Pluimen, 2001). Furthermore, career-switchers are inclined to tackle arising problems on their own. The heavy workload, autonomous classroom environment together with the experienced necessity to operate independently, in some cases increased by reserved attitude to the newcomers of the teaching staff cause reluctance to seek cooperation and support from more experienced colleagues (Ibidem).

• Acknowledgment: the author expresses gratitude to Marjo Stalmeier for reviewing earlier versions of this paper and being a great colleague and support. The paper is based on the detailed report of the progress of the pilot and pilot results published by RdMC in Dutch and available at http://www.ou.nl/eCache/DEF/17912.html
The tasks of concurrent general teacher education and an adequate on-the-job training as a teacher are extremely demanding and require adequate support both from the institutes of teacher education and from the working environment. Such support is envisaged in the form of supervision by a teacher educator ((further: supervisor) and through workplace coaching by an experienced teacher practitioner colleague (further: workplace coach). The school management as an employer of the career-switcher is responsible for allocating means and facilities for coaching and for the adequate training of workplace coaches (OECD, 2003).

In reality, teacher education of career-switchers is still in the teething problems fase. Career-switchers evaluate the fast-track teacher education programmes higher than their learning in the workplace (Bolhuis, e.a., 2001). Nevertheless, attending merely part-time classes and supervision sessions career-switchers build up little affinity with the regular institutes of teacher education. Physical distance and time constraints prevent them from seeking institute-based support through additional contacts with supervisors and peers. Supervisors in their turn are hardly able to offer more than the envisaged minimum of on-site contacts and 1-2 supervision visits to schools per year. Consequently, the contribution of supervisors and institutes of teacher education to the professional development of career-switchers remains limited.

Additionally, effective coaching in the workplace which is an absolute necessity for workplace learning (Bianco, 2006) forms a large bottleneck. Average Dutch schools are not adequately equipped to function as learning environments for their personnel. Experienced and qualified coaches among teacher practitioners are scarce. Schools fighting against teacher shortages find it difficult to allocate people and means for the task of training coaches (De Bie, 2004). Since many schools have little tradition of contacts with institutes of higher teacher education they do not use facilities developed for the purpose of training workplace coaches and have limited if any contacts with supervisors. As a result, career-switchers follow two separate learning paths and the envisaged integration of workplace experiences in a more general pedagogical frame remains problematic (Ibidem).

The Dutch Ministry of Education commissioned the RdMC Centre for the Professionalisation of Teachers of the Dutch Open University (OUNL) to develop new effective pedagogies and technologies to help combat existing blockades in teacher education of career-switchers (RdMC, 2006). Building upon the expertise of the OUNL in distance education, e-learning and development of innovative pedagogical approaches, the RdMC designs dedicated tools and complex virtual learning environments for self-assessment and self-study for career-switchers and other aspirant teachers and develops new methods for distance coaching. It also sets up field studies and pilot projects to test new tools and methods and generate new scenarios of use.

Within this framework RdMC researchers have conducted a pilot study to collect experiences and perceptions of users of the electronic portfolio as an instrument of coaching in the workplace, to generate scenarios and to test affordances of the e-portfolio as a coaching instrument. This paper presents the pilot and its results. It is structured as follows. Firstly, the paper provides the underpinning of the choice of the e-portfolio as an instrument for coaching. Secondly, it describes the pilot study and presents its results. Finally, some conclusions are drawn.

2. Why the electronic portfolio?

The choice to experiment with the portfolio as a possible coaching support tool was based on a number of arguments.

Firstly, the teaching portfolio is an accepted tool in teacher learning and education. There is sufficient evidence that this instrument enhances learning of student teachers, helping its makers to reconstruct their personal teaching practice and reflect on it in the context of learning, to document and unfold one’s learning process, “one’s journey in becoming a teacher” (Zeichner & Wray, 2001, Tigelaar, 2005, Strudler & Wetzel, 2005). The teaching portfolio provides structure for self-reflection and critical inquiry (Zeichner & Wray, 2001, Van Tartwijk, Lockhorst & Tuithof, 2002, Tigelaar, 2005, Freese, 2005). Having used the teaching portfolio in preservice teacher education portfolio-makers develop the habit of reflecting on their teaching practice and continue using the teaching portfolio for the purpose (Zeichner & Wray, 2001). Thus, the teaching portfolio becomes an instrument for effective support of continuous professional growth.
Secondly, the portfolio is a standard instrument used in intake assessment procedures of career-switchers. In such portfolios candidates describe prior learning and work experiences, tasks and activities to illustrate their competence level, underpin the choice for a teaching career and provide documents to support their statements (Klarus, 2002). Portfolio assessment together with other instruments helps to determine the focal points of the individualized teacher education programme for aspirant teachers and can be used to plan coaching strategies (Tigelaar, 2003).

Thirdly, construction of a teaching portfolio is intertwined with social interaction. Coaches, supervisors and peers contribute to portfolio construction by helping to select materials, by providing feedback on the portfolio and discussing the process of it construction (Tigelaar, 2005). Thus, they support the reflective practice of the portfolio-maker and enhance learning. Mentoring and collaboration activities around portfolio construction promote the growth of self-confidence of teachers (Zeichner & Wray, 2001).

Social interaction affordances make the teaching portfolio a suitable coaching instrument. Through the portfolio, coaches can obtain information on prior knowledge and skills, of the portfolio-makers, their experiences and ideas that might otherwise be left out (Tigelaar, Brouwer & Korthagen, 2003). The coach is thus enabled to reconstruct a more complete picture of professional and personal growth of the learners and their specific needs and use this knowledge in coaching to adjust and fine-tune the coaching strategies.

Furthermore, the teaching portfolio is not a new phenomenon for teacher practitioners in the Netherlands. The recently adopted Act on Professions in Education in the Netherlands envisages continuous assessment and self-assessment of professional growth of teachers. To support process this the Dutch Association for Professional Quality of Teachers (SBL) developed a set of teacher competence requirements (Competence requirements teachers, 2004). This organization stimulates teacher practitioners to document and demonstrate their professional growth with the help of teaching portfolios and offers a free web-based teaching portfolio based on teacher competence requirements (www.lerarenweb.nl/portfolio).

For the purposes described above both the electronic portfolio and its hard-cover equivalent are suitable. Both are widely used in practice. The specific situation of the career-switcher, the real and perceived distance from the supervisor and from the institute of teacher education in general, existing bottlenecks in the organization of coaching in the workplace make the electronic version more attractive than a hard-cover one. The electronic portfolio affords flexible use (any-time, any-place), is or can be made available to more portfolio-readers irrespective of their whereabouts. It allows including evidence in different formats (including images, voice and video). It can be attractive for both career-switchers and their coaches who may need improvement of relevant computer skills (Driessen e.a., 2002).

In sum, there is sufficient ground to assume that the electronic portfolio can be effective as a coaching instrument of workplace learning. However, there are little if any examples of its application in coaching in the workplace. Based on prior research and experiences collected in on-going projects of the RdMC the following hypotheses were formulated:

- The use of the electronic portfolio in the workplace will help the career-switcher to connect the practice of teaching to the theoretical knowledge and insights developed in the teacher education programme.
- Access to the electronic portfolios will allow the workplace coaches to contribute more effectively to the professional development of the career-switcher. The coaches will be able to juxtapose their impressions and observations of the teaching performance of their career-switchers with accounts of prior learning, work and reflections as recorded by the career-switchers themselves. A better understanding of specific learning needs and preferences of the career-switchers will allow coaches to fine-tune coaching activities accordingly.
- Access to the electronic portfolio of the career-switcher will facilitate collaboration of the teacher educator /supervisor and the workplace coach. They will be able to fine-tune their respective contributions in any-time, any-place mode, thus increasing the effectiveness and efficiency of learning of the career-switcher.
- Experiments with the use of the e-portfolio for coaching in the workplace will help further develop the instrumentation of workplace or school-based learning of aspirant teachers and may deliver valuable insights in the coaching strategies involved.
3. Objectives of the pilot study

The primary pilot objective was exploring possible coaching scenario’s that involve the use of the electronic portfolio in the workplace and testing the above given hypotheses. The pilot was aimed at generating and collecting data on:

- the e-portfolio construction and use by career-switchers who combine work in the new profession with fast-track teacher training programs;
- the use of the e-portfolio in coaching of career-switchers in the workplace and in communication between the career-switchers and their workplace coaches;
- the shared use of the e-portfolio and communication on portfolio-related issues between the supervisors and workplace coaches of career-switchers.

4. Pilot design and instrumentation

This section contains information on the pilot design, its structure, instruments and participants (paragraphs 4.1-4.4). It is followed by a brief account of the pilot’s progress (paragraph 4.5).

4.1. Pilot design

The pilot design provided career-switchers, their coaches and supervisors the opportunity to use the electronic portfolio in coaching in the workplace in their own environment. It envisaged that:

- Participating career-switchers would create an e-portfolio and use it for learning and coaching purposes. During the pilot they would communicate on the teaching practice and experiences and on other portfolio related issues with both the workplace coach and their supervisor.
- Participating workplace coaches would include the e-portfolio into the repertoire of coaching tools and use it throughout the pilot for coaching purposes.
- Participating supervisors would use the e-portfolio for supervision purposes and follow the communication on portfolio related issues between the career-switcher and the workplace coach.
- Pilot participants would share experiences with each other and discuss them in the pilot communication environment to contribute to knowledge construction on workplace coaching of career-switchers and its instrumentation.
- Participants would use a shared electronic environment for communication purposes and evaluate experiences with portfolio construction and use after the end of the pilot.

Figure 1 provides a graphical representation of the pilot design.
As illustrated in Figure 1, face to face meetings with each other and the pilot team of RdMC researches were limited to the introductory and the final workshop. Between these events the participating career-switchers were expected to work on their electronic portfolios in their own environment. They were facilitated in choosing a portfolio tool and start-up activities by the pilot team. Participating workplace coaches and supervisors were expected to work with the e-folios of their career-switchers. For that purpose they were provided support in the form of background sources and exemplary learning tasks that they could use in practice. Electronic communication environment designed for the pilot provided the necessary support for communication between career-switchers, their respective coaches and supervisors as well as between all pilot participants.

4.2. Pilot communication and learning environment

The pilot communication environment designed for the pilot in Blackboard Learning System\(^1\) consisted of two separate workplaces (Blackboard LS modules). The first one, a PORTFOLIO Workplace was open to all participants and contained general information on the pilot, background information on teaching portfolio and links to relevant web resources. The other – the Workplace for Coaches was designed to offer participating workplace coaches more resources on coaching, optional learning tasks that could be used in coaching and themes for possible discussion with peers. Communication facilities offered within Blackboard included an open discussion forum for asynchronous communication for all participants and several limited access forums: a separate forum for career-switchers, a separate forum for coaches and four discussion forums to which electronic portfolio’s of respective career-switchers were linked. Here career switchers could communicate with their coaches and supervisors on portfolio and coaching related matters. Furthermore, the pilot participants could dispose of synchronous communication (chat) tools.

\(^1\) Blackboard was chosen by the pilot team for practical and pragmatic reasons: in use at RdMC/OUNL, sufficient expertise for design and Helpdesk purposes within the pilot team, ease of learning and use for the purposes of the pilot, the availability of the necessary communication functionalities (storage of documents, asynchronous communication through discussion boards, synchronous communication through chat tools).
4.3. Electronic portfolio in the pilot

According to the pilot design, participating career-switchers were free to use any electronic portfolio at their disposal on condition that others (workplace coach, supervisor, pilot team) could get access to the portfolio or to a specific part of it, upon the owners’ choice. For those who did not have an electronic portfolio an instrument could be offered free of charge by the RdMC or the SBL portfolio could be used. All pilot participants chose the SBL portfolio. Availability of this tool and its ease of use prompted the choice.

The SBL-portfolio is a web-based application built around Teacher Competence requirements (www.lerarenweb.nl/portfolio). The portfolio includes an introductory home page, sections as Curriculum vitae, Teacher competence profile, Professional identity, Personal development plan and a Dossier. For portfolio construction no web editing skills are needed and 24-hours Helpdesk service is provided by the SBL. The process of portfolio construction is supported by web forms and questionnaires for self-assessment and competence level scans. The portfolio-maker is free to use all or some of available tools or provide reflective statements in a free format. The portfolio dossier can hold a collection of artifacts up to 10 MB. As the portfolio owner, its maker can make the portfolio visible for a selected group or include it in the collection of model teaching portfolios of the SBL web community.

Figure 2 illustrates the navigational structure of the SBL portfolio. A navigation menu in the right sidebar provides links from the homepage to other sections in the portfolio, each section may contain one or more pages.

Figure 2 Navigation in the SBL portfolio (source: www.lerarenweb.nl/portfolio/voorbeelden/index.html)

4.4. Participants

The pilot design envisaged the participation of 6-7 groups, each including a career-switcher and the assigned workplace coach. Participation of supervisors was considered highly desirable but not compulsory. Participants were recruited via a direct telephone poll of secondary schools in the Dutch provinces Limburg and North Brabant and via the institute of higher teacher education in Utrecht. Five schools where career-switchers were employed agreed to participate and 7 groups could be formed. One school, however, withdrew due to an internal reorganization. Eventually four secondary schools
participated in the pilot, including four career-switchers, their workplace coaches and one supervisor. Another supervisor, though not officially a pilot participant, contributed to the pilot upon request of the career-switcher.

All participating career switchers were at the intermediate or final stage of their teacher-training programs, had low to intermediate level of computer skills and no or little prior experience with the electronic teaching portfolio. Participating workplace coaches had above 10 years of work experience as teachers and from 1 to 3 years experience as a workplace coach, they had from low to intermediate level of computer skills and no prior experience with portfolio. The only participating supervisor had ample professional expertise (40 years), had been working with the paper portfolio as a coaching and assessment instrument for x years and had low computer skills.

4.5. The pilot’s progress

At the introductory workshop participants got acquainted with each other, shared personal goals and discussed pilot objectives. Introductory presentations on the electronic teaching portfolio and its use for teacher learning and coaching purposes were given, the participants got acquainted with the pilot communication environment and practiced using the available tools in a hands-on session. In the initial stage of the pilot the participants were supported in choosing an electronic portfolio and getting started with using it within the existing framework of workplace coaching. They were encouraged to reflect upon their experiences of using a new instrument, to share and discuss impressions with fellow pilot participants and the pilot team in on line forums moderated by the pilot team. Pilot activities related to coaching took place in the workplace between the career-switcher and the coach. Participants communicated with the pilot team and other participants through the communication environment in Blackboard. The second live event, the final workshop - took place at the end of the pilot. A final discussion of results, experiences and viewpoints was conducted. Participants shared opinions on the workplace coaching of beginning teachers and evaluated the use of e-portfolio as the coaching support tool.

As for the interaction in the course of the pilot, during the first 1,5 months of the pilot this was limited to introductory statements and comments on the portfolio choice. The pilot team provided helpdesk support for using communication facilities (discussion forum, chat) and start-up of the electronic portfolio (opening an account, uploading artifacts). Two months after the pilot’s commencement communication through various discussion forums became active. Exchange of experiences and opinions took place in a general forum and in separate forums of career switchers and their coaches. Career switchers exchanged solutions to specific portfolio related issues (what evidence to collect and how to collect it), and professional activities (classroom pedagogy, motivating learners etc.). Communication in the electronic workplaces around individual portfolio’s remained limited to several general introductory messages.

5. Data collection and analysis

To test the formulated hypotheses and answer the research question, several data collection methods were employed. The start questionnaire provided data on the background, prior knowledge of the teaching portfolio, coaching background as well as on computer skills and motivation to participate in the pilot. The exit questionnaire covered the pilot evaluation and the self-assessment of change in portfolio-related knowledge and skills and the perceived effect on coaching strategies. Content analysis of on line communication allowed the pilot team to collect impressions of both portfolio construction process and using this tool in coaching, arising problems, needs and preferences of the portfolio users. Discussions at the final workshop were used to collect shared opinions on the perceived value of the e-portfolio in workplace coaching, on preferred affordances and possible use patterns. Finally, semi-structured in-depth interviews were held with each participant. Interviews were recorded, transcribed and verified by the respondents. Interviews covered the portfolio making experiences, pursued workplace coaching strategies in general and during the pilot in particular, views on improving workplace coaching of beginning teachers and the use of the e-portfolio for this particular purpose.

No quantitative analysis was undertaken; all instances of communication, statements and answers were included in the analysis. Data from all sources was clustered per category by two pilot team members independently, eventual differences were eliminated. Based on data from questionnaires, on line communication and the final discussion a reconstruction of portfolio and coaching related activities of
each duo (career-switcher and workplace coach) was undertaken. Data from interviews served to complete and verify the reconstructions.

6. Pilot results

Inferences made on the basis of the pilot data cannot be generalized. However, based on the reconstruction of portfolio related activities of career-switchers and their coaches in the pilot, an overview of possible coaching strategies involving e-portfolio could be made. In paragraph 6.1 the results of portfolio construction are discussed. Paragraph 6.2 is devoted to observed coaching strategies. Evaluation data collected in the pilot is presented in paragraph 6.3. Since participation of teacher educators (supervisors) in the pilot was limited, no data was generated on the possible effect of communication between the workplace coach and the supervisor on the quality of learner support.

6.1. Four instances of portfolio construction & use

In the pilot four cases of portfolio construction and use in coaching were monitored. Four career-switchers constructed electronic portfolio’s and used them in contacts with their workplace coaches, though the degree and the quality of use differed. Table 1 presents an overview of portfolio construction patterns as observed in the pilot per case as well as related coaching activities observed in the pilot (discussed in p.6.2).

<table>
<thead>
<tr>
<th>Prior knowledge</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-portfolio construction: the content</td>
<td>*background; *reflection on prior learning &amp; work; *reflection on teacher competence requirements; *personal development plan; *dossier: artifacts, lesson plans, instances of instruction</td>
<td>None</td>
<td>Hard-cover portfolio for assessment and supervision</td>
<td>Marginal: initial exploration of the e-portfolio</td>
</tr>
<tr>
<td>E-portfolio in the coaching during the pilot</td>
<td>*subject of coaching sessions; *input for coaching sessions</td>
<td>*input for coaching sessions</td>
<td>*One time initial exploration</td>
<td>*One time initial exploration</td>
</tr>
<tr>
<td>Portfolio related activities of the coach (both paper &amp; electronic)</td>
<td>*comments on the portfolio during f2f sessions; feedback, *Preparation for f2f sessions; *preparation for participation in the the final assessment</td>
<td>*One-time feedback on the completed portfolio in the pilot communication environment; *preparation for f2f sessions upon request of the coach</td>
<td>*Advice on portfolio construction (paper portfolio)</td>
<td>none</td>
</tr>
<tr>
<td>Coaching strategies &amp; actions during</td>
<td>*regular f2f sessions e-portfolio - subject &amp; structure</td>
<td>*ad hoc f2f sessions: school &amp; teaching related issues, tips &amp;</td>
<td>*ad hoc f2f sessions: tips on teaching and behaviour in class,</td>
<td>*ad hoc f2f sessions correspondences through e-mail on</td>
</tr>
</tbody>
</table>

2 Including all prior portfolio related activities of the career switcher
Table 1 Portfolio construction patterns observed in the pilot (Firsova, e.a., 2006)

<table>
<thead>
<tr>
<th>the pilot</th>
<th>* feedback in the e-portfolio</th>
<th>advice</th>
<th>tips on portfolio construction:</th>
<th>classroom practice, feedback, tips</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-portfolio construction personal goal</td>
<td>Demonstration of achievements &amp; professional growth</td>
<td>Demonstration of achievements</td>
<td>Exploration of an electronic tool</td>
<td>Support of progress in teacher development</td>
</tr>
</tbody>
</table>

Table 1 demonstrates four different patterns of portfolio related activities in the context of workplace learning. In one case the process of portfolio construction could be observed in the pilot (case 1), in other cases the e-portfolio was the result of a one-time activity (cases 2, 3 & 4) with different results. In case 1 the e-portfolio contained a rich and varied representation of self-reflections, produced instructional materials and artifacts, feedback received in the process of portfolio construction etc. In case 2 the e-portfolio was limited to a collection of artifacts in the portfolio dossier. The case 3 e-portfolio served as an electronic duplicate of the paper portfolio and in case 4 the portfolio was “poorly” filled because the career-switcher found it difficult to reflect on teacher competence requirement statements and to express his ideas on teaching in the suggested format.

In sum, the portfolio construction patterns demonstrated in the pilot reflected the goals set by the portfolio-makers, including a demonstration of professional growth and level achieved by the end of the fast-track teacher education programme (case 1), a presentation of achievements via collected artifacts and other materials (case 2); an exploration of an electronic tool (case 3) and an attempt to express experienced difficulties, to draw attention of others to the problems (case 4).

6.2. The electronic portfolio and coaching strategies in the pilot

The pilot though of short duration allowed the reconstruction of several portfolio use patterns in relation to coaching in the workplace.

Introduction of a new instrument did not radically change existing coaching strategies and activities as observation of lessons and informal face to face coaching sessions. Discussion of issues reflecting daily classroom practice, arising problems and possible solutions remained central. In all four cases, however, the e-portfolio had some impact on the coaching. In the pilot the following instances of portfolio-related coaching activities were observed:

- Regular coaching sessions were organized around the e-portfolio. In the one hour long sessions the career-switcher and the coach shared a pc navigating through the e-portfolio together. The portfolio construction, collected materials, and reflections of the portfolio-maker became the subject of discussion. These sessions also helped the coach to get familiar with this instrument and learn to navigate in it (case 1).

- During the coaching sessions the coach gave tips on portfolio construction (what material to include, how to describe specific work related activities in the competence requirements frame). This happened on ad-hoc basis when requested by the career-switcher (case 3).

- The coaches consulted the portfolio of the career-switcher on their own preparing for coaching sessions. The portfolio provided the coach with the background information and personal evaluations of the portfolio maker on the issue to be discussed in the session (cases 1, 2).

- The coach consulted the portfolio of the career-switcher on her own preparing to participate in the final assessment of the career-switcher at the teacher education institute (case 1).

Furthermore, in one case (case 4) participation in the pilot served as a stimulus for activating coaching on a structural basis. Regular communication via e-mail became an important coaching instrument. The career-switcher sent the coach reports and reflections on daily classroom experiences and arising problems and the coach responded with feedback and tips. Although the e-portfolio construction and portfolio related activities did not become part of the coaching strategy in this case, participation in the pilot helped to make the bottlenecks in the existing approach visible. Focus on electronic tools for coaching helped the coach choose a suitable coaching strategy.
6.3. Evaluation of the e-portfolio by learners and their workplace coaches

In the pilot data was collected on user evaluation of the e-portfolio instrument used, of the portfolio construction process and portfolio related coaching activities.

Evaluating portfolio related activities participating career-switchers spoke of a positive and meaningful experience. Firstly, portfolio makers appreciated the ease of use and scaffolds provided in the form of fill-in questionnaires, templates and clear though not rigid structure of the offered e-portfolio. Limited effort and time investment in portfolio construction, being able to demonstrate portfolio construction results at once were perceived as the evidence of the efficiency of this instrument, increased appreciation of it and the willingness to use it. Secondly, presenting a complete collection of results of one’s professional development (the whole oeuvre) in a compact form corresponded in the perception of the career switchers with the effectiveness of e-portfolio as a coaching tool. Furthermore, the perception of effectiveness of this instrument was increased by communication affordances of the e-portfolio as envisaged in the pilot. Although the participants could not give or receive feedback directly in the e-portfolio and used the pilot communication environment (in Blackboard) or e-mail for the purpose, in their perception communication tools were valuable components of the electronic portfolio.

The pilot demonstrated that the portfolio construction requires high writing and argumentation skills and may be found quite demanding by a career switcher. The task of elaborating on teacher competence requirements statements in the portfolio can be experienced as time-consuming and abstract. Further critical remarks of portfolio makers as collected in the pilot concerned limitations of the SBL portfolio tool which, as an open access web-based tool, offered limited space for storage of artifacts. The pilot participants missed a clear structure in the dossier section of the portfolio and regretted not being able to connect their statements to “evidence” in the dossier in an efficient way (hyperlinks).

As for the coaches, initially they were rather sceptical about the e-portfolio as a tool for coaching in the workplace. They lacked a general reference frame within which such an instrument could be used. However, all were moderately positive about the experience in the pilot and expressed willingness to experiment with the instrument in their own teaching and coaching practice in the future. The workplace coaches acknowledged that using the e-portfolio helped them to prepare in an efficient way for scarce face to face coaching sessions, thus enhancing efficiency of coaching (cases 1, 2). In the perception of one of the coaches, working with the e-portfolio helped reduce the distance between the coach and the career-switcher: “we were going through the learning process together”. Availability of “a helicopter view” of the professional development of the career-switcher due to the access to the e-portfolio was typified as an enrichment of the coaching process. The coach who consulted the e-portfolio’s of her career-switcher on a regular basis appreciated the ease of navigation in the portfolio, its 24-hours availability and its learnability. Similar to portfolio makers, the coaches were less satisfied with the absence of a clear structure of the portfolio dossier and direct links between statements of the portfolio maker and the evidence collected in the dossier.

Discussion and conclusions

Looking back at the results of this five-month long pilot study we can state that its objectives, though quite ambitious for such a short time experiment, were realized to a large extent. The four participating career-switchers succeeded in start-up portfolio construction activities and in using it in communication with their coaches. The four workplace coaches were for the first time in their coaching practice confronted with a new instrument and appreciated the results that this experiment yielded. Several use patterns were observed and portfolio evaluation provided valuable insights in demands and preferences of workplace learners and their coaches as portfolio users. These results allow us to draw some conclusions and define areas for further study and experimenting.

In the first place, the pilot demonstrated feasibility of portfolio construction in the context of workplace learning and confirmed our hypothesis that the use of this instrument as a coaching support tool in the workplace can be effective.

The constructed e-portfolios helped the portfolio-makers to demonstrate achievements of both work and teacher education, to increase involvement of their workplace coaches in the process of professional
development. The career-switchers expressed very clearly their preference for a easy to use instrument that would not demand much additional time and effort and would quickly yield tangible results. In their perception, the electronic portfolio as used in the pilot helped increase flexibility and efficiency of contacts with the coach and offered usable scaffolds for reflection on teacher competence requirements.

In the pilot the e-portfolio helped to structure coaching activities, supported preparation of the coach for coaching sessions and served as an additional feedback channel. The coach got broader access to the general background, educational history and viewpoints of the portfolio-maker which provided additional input for coaching activities. Adding this instrument to the “toolbox” of the workplace coach enlarged the coaching repertoire and was motivating for both the learner and the coach.

Appreciation of real and perceived communication affordances of the e-portfolio by both portfolio-makers and their coaches is another important pilot result. Although logically face to face contacts remained the primary communication channel in workplace coaching, the introduction of the e-portfolio as a coaching tool stimulated its users to try out on-line distance communication channels and increased their awareness of the added value of such tools.

In the pilot communication affordances of the e-portfolio were not fully enjoyed. Limited participation of teacher supervisors made it impossible to test whether on-line communication between the career-switcher, the workplace coach and the supervisor through the e-portfolio can benefit workplace learning. Positive experiences of the pilot participants with on-line communication through the e-portfolio indirectly support our hypothesis but are inconclusive.

The participating career-switchers were relatively far in the teacher education process. Their workplace coaches had already chosen a strategy and certain communication patterns had been worked out before the pilot. Thus, the pilot participants had to include new elements in already existing patterns, make adjustments in the chosen strategies. The constructed portfolios were to a large extent based on already existing collections of prior made artifacts and statements. From the learning perspective the effect of the portfolio use in the pilot was limited.

The current trend in school-based teacher education in the Netherlands goes further than the organization of alternative paths and fast-track programmes for career-switchers only. It includes joint projects of institutes of higher teacher education and specific secondary schools (Ten Dam & Blom, 2006), professional development schools (Kallenberg, 2006), and numerous local Dutch initiatives under the motto “Educaten together” (f.e., in Utrecht, http://www.feo hvu.nl/samenopleiden/). Further research of workplace learning for the teacher profession and workplace pedagogies is needed. The experiences collected in this pilot indicate that design-based research can be a feasible option for testing how the e-portfolio can enhance the potential of the workplace as a learning environment for teachers. It is a challenging and a promising task!

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Implementation of an ePortfolio as a University-wide Program at the Florida State University: Implications for National Models in the US and Internationally

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Abstract

The ePortfolio at Florida State University has been in operation for over four years. It was developed through the leadership of the Career Center, and supported by the University president and key administrators in student and academic affairs. It was successfully implemented and integrated within university culture, as evidenced by over 36,000 users since its campus-wide launch. This paper describes the ePortfolio’s developmental history, philosophy, goals, and design considerations, implementation strategies, evaluation, use in accreditation, and transfer to other universities.

Introduction

An ePortfolio system was conceived, designed and implemented at the Florida State University (FSU). The FSU Career Portfolio is based on extensive research by FSU Career Center staff and faculty regarding skills and experiences desirable for inclusion in ePortfolios and the program has proved to be highly successful at FSU. Components of the FSU Career Portfolio include: Student Profile; Skills/Experiences Matrix; Resume or Vitae; Academic Transcript; References; Artifacts/Work Samples. The Skills Matrix is the primary working surface of the portfolio and includes the following: Communication, Creativity, Critical Thinking, Leadership, Life Management, Research/Project Development, Social Responsibility, Teamwork, Technical/Scientific. Up to six additional skills may be added based on the learner’s interests or can be suggested by faculty members. Evidence of skills is documented through the following matrix experiences: Courses, Jobs/Internships, Service/Volunteerism, Memberships/Activities and Interests/Life Experiences. The artifacts component allows learners to upload documents of all types ranging from word documents to PowerPoint as well as photographs and streaming video. The Portfolio is fully customizable, student managed and can be accessed electronically by referred users including employers, graduate schools or faculty members. The FSU system represents a leading example of a successfully launched university-based ePortfolio at the national level in the US. For example, since the Portfolio system was initiated at FSU in 2002, over 38,000 individual FSU students have used the Career Portfolio. During the 2005-2006 academic year, 12,099 new FSU students created portfolios. Obviously, with a total enrollment of approximately 40,000 students, the Career Portfolio represents a university-wide program and has become part of the campus culture at FSU. The success of the program at FSU is a result of the comprehensive and user friendly design coupled with the support of faculty, advisors and the university academic administration. The FSU Career Portfolio can be viewed at http://www.career.fsu.edu/portfolio/.

The FSU Career Portfolio has been successfully adapted and implemented in Florida for use with other in-state colleges and universities through the Florida Academic Counseling and Tracking Systems for students (FACTS). Also, another US university, the University of California, San Diego successfully created and implemented a university-wide ePortfolio system based on the FSU model and the Georgia Institute of Technology (Georgia Tech) is on the verge of launching a portfolio system adapted from the FSU ePortfolio. In light of these successful adaptations, FSU signed an agreement to license to transfer
the Career Portfolio concept, design a code to Symplcity corporation where a new version will be designed and distributed to other US institutions through the National Association of Colleges and Employers (NACE). The ePortfolio based on the FSU design will be marketed nationally as a module within the NACElink career services software system. FSU also licensed the ePortfolio to a private company for adaptation and distribution in Japan. Furthermore, FSU is collaborating with the University of Jyvaskyla in designing an ePortfolio that may support the Finland national higher education system. The most recent development regarding the FSU ePortfolio is signing a contract to edit a New Directions in Student Affairs series book published by Jossey-Bass entitled: Emerging Student ePortfolios: Opportunities for Student Affairs.

**History**

The FSU Career Portfolio Program was in development for five years before its campus-wide launch in April 2002. The catalyst for development of the FSU Career Portfolio occurred in September 1997, when the President of the University approached the Career Center regarding ideas to teach and/or certify the development of workforce skills in FSU graduates. Proposals by Career Center staff described an online portfolio system for developing and documenting students’ skills and accomplishments. Several funding proposals were considered, and in December 1999, the University granted funding for a full-time position (project manager) to lead the development of an ePortfolio program at FSU.

Research into existing programs through other universities and vendors did not reveal a system that would meet the desired goals. The Career Center wanted to create a program with University-wide applications, and thus decided to develop a portfolio system specific to FSU, leveraging existing technology, i.e., the student online security system, and integrating existing student databases.

For 18 months, a 7- to 9-person task force within the Career Center met weekly to discuss the goals, philosophy, and design of the FSU Career Portfolio, and a prototype was developed to showcase this work. This prototype was shared with administrators, students, and employers to gather feedback and assist in further development. It was also used as the basis for Information Systems to build the technical infrastructure to support the system. The prototype provided clear and detailed specifications for the design and functionality of the system. This allowed Information Systems staff to understand and support the vision of the Career Center. Information Systems had a team of 12 programmers, technical managers, and project managers who contributed to the development of the system (two of whom worked full-time on the Career Portfolio during the development phase). The Portfolio Task Force sought feedback from administrators, staff, and employers throughout the development phase. In general, the response was very positive, with employers, faculty, administrators, and students reacting favorably to the design, philosophy, and usability of the system. Many design changes were made as a result of the feedback gathered through the development, improving the system’s usability and design.

One of the key steps in the developmental process was outlining clearly the philosophy, purpose, design considerations, and goals of FSU’s ePortfolio system. These points are described in the following section.

**Philosophical Basis and Goals**

Four philosophical principles are basic to the FSU Career Portfolio Program (CPP). First, the CPP involves a desire to create a system that enables students to develop and pursue a personal, strategic career vision. Second, the CPP is founded on a belief that the University should be dedicated to producing graduates needed in an emerging global economy characterized by lean production, information technology, and alternative ways of working (Reardon et al., 2006).
Third, the CPP focuses on employers of college graduates who value evidence that students are ready to make effective contributions in the contemporary workplace. Fourth, the Career Portfolio Program is based on the idea that career-planning services are a boundary spanning function linking education and employment, providing for connections between education, work, and community organizations. In summary, the Career Portfolio Program was viewed as an operational system that could provide a new scheme for introducing the concepts of career and work to the university and its constituents. It was seen as having the potential to provide a developmental, comprehensive, learner-centered emphasis for educational and career planning services at the University (Reardon, Lumsden, & Meyer, 2004).

**Design Considerations**

Based on the results of early research, surveys, and development work, 13 design considerations for the FSU Career Portfolio were developed by the Portfolio Task Force:

- Be student-centered, based on learning activities throughout the undergraduate and graduate school years
- Enable students to plan and pursue a strategic career vision
- Enable students to select and pursue learning activities within and outside of their formal curricula that would enhance the likelihood of their achieving personal and professional goals
- Be initiated and sustained by student involvement, with assistance from many university resources
- Be available to students in all majors, in both self-help and brief staff-assisted modes of intervention
- Use sophisticated technology available via the Internet
- Provide a method for selecting, acquiring, and documenting career skills
- Be available to students at any level, from lower division students to final-term seniors, from graduate students to alumni
- Provide employers with documentation that FSU students are ready to make effective contributions in the workplace
- Promote career preparation throughout students’ undergraduate or graduate educational experiences, not as something that can be accomplished with one visit to the Career Center
- Address the needs of students, faculty, employers, and the public, including parents
• Increase the economic productivity and career satisfaction of graduates, as well as public support for higher education

• Involve many different agencies and programs in the university, such as service learning (volunteer work that enhances the classroom experience), academic advising, student recruiting, job placement services, cooperative education, classroom instruction, student activities and organizations, liberal arts courses, and pre-professional training programs (Reardon, Lumsden, & Meyer, 2004).

Goals

After reaching a consensus on the general characteristics and scope of the proposed FSU Career Portfolio Program, the Task Force specified four general program goals. FSU would seek to develop (1) a comprehensive system for helping students connect learning opportunities with employer needs; (2) a program for helping students integrate curricular and co-curricular experiences; (3) an innovative Internet-based system to promote student learning, career preparation, and employment; and (4) a high-visibility program to positively support student recruitment and retention.

With respect to student learning outcomes, it was determined that as a result of engaging in the FSU Career Portfolio Program students would be able to (1) develop strategic planning skills that prepare them for the job campaign or post-graduate study; (2) be aware of the importance of identifying and developing transferable career/life skills; (3) identify learning opportunities that foster career/life skills; and (4) know how to communicate and market career/life skills to potential employers or graduate/professional school admissions committees.

A key element of the Career Portfolio has been the identification of skills that are valued in the workforce and in many other life roles. These skills, which later became the Career Portfolio’s Career/Life Skills, include (1) Communication, (2) Creativity, (3) Critical Thinking, (4) Leadership, (5) Life Management, (6) Research/Project Development, (7) Social Responsibility, (8) Teamwork, and (9) Technical/Scientific skills (Lumsden et al., 2001). This list was developed by the Portfolio Task Force, and was based on research regarding the skills that employers look for in prospective employees. In addition, eight of the nine skills (those listed above with the exception of research/project development) were rated by employers who recruit at Florida State University in terms of the importance of the skill and the frequency of its use within the employers’ organizations. Employers validated these eight skills as important to their organizations and utilized frequently within their organizations. Detailed results can be found in Reardon, Lumsden, & Meyer, 2004. The Portfolio Task Force added the ninth skill area, research/project development, at the urging of the University president to reflect the importance of research at FSU. The development of a consensus within the university community about this list of career/life skills, including faculty from across the campus in professional schools and liberal arts areas and advising staff from varied offices, was an important accomplishment of the FSU Career Portfolio (Reardon, Lumsden, & Meyer, 2004).

Implementation and Integration

The Career Center recognized that for its ePortfolio system to be successful beyond the development of the technology, it would need to work hard to implement the Career Portfolio Program across campus and integrate it with other University programs and initiatives. Four important initiatives for implementation and integration are the launch of the Career Portfolio, promotion through partnerships with faculty and advisors, freshman interest groups, and the Career Portfolio contest.
Launch of the FSU Career Portfolio

The FSU Career Portfolio was launched campus wide on April 26, 2002, at a formal reception attended by over 150 faculty, administrators, staff, students, employers, and friends. Rather than focus solely on students, the Career Center targeted faculty, staff, and administrators in marketing the Career Portfolio launch event. The rationale was that partnerships with these groups would be critical to the success of the program, as they could continue to promote the system to students year after year. The event attracted local media and the launch of the CPP was highlighted on the local evening news. In addition, articles were published in the State, a bulletin for FSU faculty and staff, as well as the FSView, the FSU student newspaper, and the Tallahassee Democrat, the local newspaper.

Promotion through Partnerships with Faculty and Advisors

In addition to direct, self-help use, students are encouraged to develop their FSU Career Portfolio in the context of various courses, academic advising, career planning classes, outreach presentations, and one-on-one career advising. Each of these interventions involves varied faculty and staff working with students in their respective roles and relationships.

Every section of First Year Experience (FYE) classes (approximately 45-55 sections per year) visits the Career Center and is introduced to the CPP. During freshman orientation, all incoming students and their parents can attend an information session on the CPP. Outreach presentations are conducted throughout campus, often at the request of faculty members or student groups.

Career Center staff members continue to be encouraged with the number of college faculty and departments who require students to complete one or more sections of the Career Portfolio. Faculty from several colleges, including Nursing, Human Sciences, Communication, and Education, assign students to build portions their Career Portfolios over the course of the semester. Several departments (e.g., Communication Disorders, Theatre, Athletic Training) actually require their students to submit a completed Career Portfolio during their senior year as part of graduation requirements. These Career Portfolios are developed by students throughout their enrollment in the specific major with different courses requiring different components of the Career Portfolio to be created. For example, the Theatre department requires all entering students create a Career Portfolio as part of the introductory course that is required. Then in the senior capstone course, the Career Portfolio must be updated and presented to their faculty and peers.

Academic advisors use the CPP when meeting with students to develop programs of study and establish educational goals, particularly in conceptualizing generic skills drawn from learning activities in the liberal studies curriculum and other courses. Advisors encourage students to find courses and activities that will help develop desired career/life skills.

The Career Center offers multiple sections of a career planning class, and building a career portfolio is incorporated into the course. The CPP is also introduced during career advising, where students drop in to get assistance with their career planning and employment needs. Internship, cooperative education, and volunteer work experiences provide additional learning events that can be categorized into one or more of the career/life skill categories. Reflection upon the meaning of these learning experiences with a mentor or advisor will facilitate portfolio development.

Freshmen Interest Groups (FIGS)

Another program that is utilizing the FSU Career Portfolio is the Freshman Interest Groups (FIGS). FIGS are programs that allow freshmen to register for a cluster of courses that have been linked to a specific theme or program. This allows students to enroll in courses where they will meet other students with
similar interests. In addition, students participating in FIGS are required to enroll in a colloquium course where they learn to reflect on their experiences both in and out of the classroom to develop a more complete understanding of themselves and their future. A major component of this colloquium course is the completion of the FSU Career Portfolio. Students are required to build the profile, skills matrix, and artifacts sections of the Career Portfolio and then share it with their FIG leader (an advanced undergraduate colloquium leader). The students receive feedback from the FIG leader regarding their entries and the quality of their reflection on their experiences. This teaches and encourages students to reflect on their learning experience, and helps them to recognize and articulate skills they are developing.

**Career Portfolio Contest**

Since 2003, the Career Center has held a Career Portfolio contest during the fall semester to identify high quality portfolios. The contest helps the Career Center learn about the quality and content of Career Portfolios being created by FSU students. In addition, the contest increases awareness of the Career Portfolio program to FSU students, faculty, staff, and administration. The contest also increases awareness among employers about the Career Portfolio Program, and it helps the Career Center learn more about employers’ attitudes towards using it in evaluating candidates.

To market the event to students and members of the university community, promotional materials are distributed throughout campus and electronic media is used by the Career Center (e.g., website, email) to communicate with students, employers, and university faculty and staff about the contest. Rules and procedures for the contest are posted online during the two-month long contest period. Students are encouraged to visit the Career Portfolio’s website for information pertaining to the minimum criteria required to enter the contest. Scholarships are awarded to the first, second, and third place winners. The Career Center provides the opportunity for a corporation to sponsor the contest, which covers the costs associated with operating the contest and awarding the scholarship prizes.

All contest entries are evaluated using a three-step screening process. First, entries are screened by Career Center staff to ensure that each meet the minimum requirements outlined in the contest rules. Students that do not meet the minimum requirements are not advanced to the second phase of the process. Those entries that meet the contest requirements are then passed on to the Career Center Portfolio Committee for a second review. The top scorers from this review process move to the next round, which is a thorough review by employers and university administrators who serve as judges. Each top entrant is randomly assigned to three judges. Judges evaluate four or five student portfolios and submit their ratings to the Career Portfolio’s project management team. The top three students are invited to attend a luncheon during Seminole Futures, Florida State University’s bi-annual career exposition. At the luncheon the first, second and third place winners are recognized for their achievement and awarded the scholarship and a certificate stating their accomplishment.

Overall, the quality of the submitted portfolios for the last two years has been impressive. Many students included a variety of different courses they completed over their college years. In addition, entrants chose to include many different types of documents in the Artifacts section. Some examples of these artifacts included PowerPoint presentations, statements of purpose, syllabi for courses they taught, websites they designed, an audio clip of the student playing a selected piece of music, and sketches they drew. Furthermore, a wide range of work and volunteer experiences were represented by the contest entrants. Portions of the winners’ Career Portfolios are available at www.career.fsu.edu/portfolio/contestwinners.html.

1st Place Undergraduate Winner of 2005 Career Portfolio Contest
The Career Portfolio Contest provides many benefits, including increased promotion efforts of the CPP across campus, insight into the quality of student ePortfolios, increased awareness of employers who serve as judges and who attend Seminole Futures where the winners are announced, and allows the Career Center to gather data from the employers regarding their usage of the CPP in evaluating candidates.

The integration of the FSU Career Portfolio Program within the university community has been far reaching. Faculty and staff continue to request Career Portfolio presentations for their classes and student organizations, and student usage of the program continues to rise each semester. A need to evaluate the program from different vantage points arose with the success of university-wide implementation and integration of the CPP. The following section outlines feedback from both students and employers regarding the CPP to date.

**Student and Employer Evaluation**

The FSU Career Portfolio has undergone several activities aimed at evaluating its effectiveness as a career development tool. Both students and employers provided feedback regarding the CPP and the
evaluation efforts continue to be conducted on an annual basis. The most recent evaluation data will be posted at www.career.fsu.edu/portfolio in the future.

**Student Evaluation Results**

In 2003, Career Center staff created an online survey in an effort to collect information related to students’ perceptions of the Career Portfolio. This survey asks students to rate the program’s effectiveness and to indicate how they intend to use their Career Portfolio. The online survey is sent electronically to all students who are required to complete one or more portions of the Career Portfolio as part of a class assignment.

Between 2003 and 2005, 1,437 surveys were emailed to students enrolled in a variety of courses ranging from an undergraduate nursing class to a graduate level higher education class. Completed surveys were obtained from 198 students, a response rate of about 14%. Ninety percent of the respondents were female. Students were asked to check off all the people who helped them develop their Career Portfolio. Faculty (47%) or career advisors working in the Career Center (20%) were most frequently mentioned. Twenty-one percent received help from no one. These individuals most likely were able to navigate the CPP on their own and follow the directions to build and manage their Career Portfolios.

The survey included 10 items related to the goals of the Career Portfolio Program. Students had the option of strongly agreeing, agreeing, disagreeing, or strongly disagreeing to statements aimed at evaluating the effectiveness of the CPP. Students could also check “not applicable.” The majority of students had positive views of the CPP. A summary of the findings is shown below:

- 71% strongly agreed or agreed that the CPP helped them find experiences at FSU that would lead to the development of transferable skills.
- 63% strongly agreed or agreed that the CPP helped them find experiences in the community that would lead to the development of skills.
- 84% strongly agreed or agreed that the CPP helped them understand how their academic and professional skills related to personal career goals.
- 80% strongly agreed or agreed that the CPP helped them show evidence of interpersonal skills needed to work with or for others.
- 89% strongly agreed or agreed that the CPP helped them to show evidence of skills developed in their academic program.
- 87% strongly agreed or agreed that the CPP helped them show evidence of skills developed through volunteer experiences, part-time employment, internships, and/or a cooperative education program.
- 84% strongly agreed or agreed that the CPP helped them show evidence of skills that could apply to a variety of occupations.
- 84% strongly agreed or agreed that the CPP helped them show evidence of skills necessary to obtain and maintain employment.
- 86% strongly agreed or agreed that the CPP helped them communicate their skills to potential employers.
81% strongly agreed or agreed that the CPP helped them prepare for job searching and interviewing.

Students were also asked to indicate how they intended to use their completed Career Portfolio. The most common use was to satisfy the course requirement, which was not surprising because the online evaluation was only sent to students enrolled in a course that required the Career Portfolio. Besides using it for a class assignment, the top three ways students planned to use their Career Portfolio were applying for a job, identifying their skills, or applying for graduate or professional school. The two least frequent uses identified by students were applying for an internship and interview preparation.

**Employer Evaluation Results**

In addition to the surveys designed for students’ feedback, Career Center staff took several opportunities to solicit evaluation data on the Career Portfolio Program from employers. Prior to the launch of the CPP in April 2002, employers provided input into the design of the system including which skills were needed most and used most frequently in the workplace, the “usefulness” of an online career portfolio system in their recruiting efforts, and the usability and effectiveness of the first CPP prototype. A detailed description of these early employer surveys can be found in Reardon, Lumsden, and Meyer (2004).

After the launch of the FSU Career Portfolio, questions regarding the CPP were added to employer evaluations for career expositions and on-campus recruiting. Data were collected from fall 2002 through spring 2004 from 351 employers (an average response rate of 34%). Five groups were included in these data: (1) on-campus recruiters 2002-2003; (2) on-campus recruiters 2003-2004; (3) Seminole Futures Career Exposition fall 2003; (4) Seminole Futures Career Exposition spring 2004; and (5) Engineering Day Career Exposition fall 2003. The survey respondents represented industries that typically recruit at FSU: 32% retail, 27% financial, 18% engineering, 16% technology, and 7% government.

In terms of familiarity, 42% of employers were familiar with the CPP across the five groups. Twenty-seven percent (27%) of these respondents had been given access by a student to his/her Career Portfolio. Those employers who had been given access rated the Career Portfolio as above average in terms of being beneficial in identifying students’ skills. In summary, familiarity with the online portfolio is increasing among employers, yet only 1 out of 11 has been provided access by a student. Employers with access rated the effectiveness of the online portfolio as above average.

In addition, the Career Center was interested in seeking feedback from employers who served as judges in the Career Portfolio Contest. The intent was to receive feedback from employers who had thoroughly examined students’ portfolios. Seven of the eight judges completed a survey about the Career Portfolio system and how he or she might use it during the selection process. Three out of seven employer judges believed they would use a student’s Career Portfolio during the secondary interview process and two believed they would use it during the application process. Overall, six of the seven employer judges believed they would use the Career Portfolio in assessing candidates for their organization. Employers were asked to rank, in order of usefulness in evaluating candidates, the different components of the Career Portfolio system. This resulted in the resume being ranked as most important by seven of the judges. According to four of the judges, the Artifacts section was second in importance. The Profile was ranked as third by four of the employers and the student transcript was ranked in fourth place according to four of the judges. The References section was ranked as least useful by six of the judges.

The evaluation of the Career Portfolio Program continues to grow. Efforts to reach more student users and employers who are familiar with the system are in place. Every semester, evaluation data continue to be analyzed and added to previous evaluation results.
With the success of implementing and evaluating the FSU Career Portfolio, some unexpected benefits materialized. First, the FSU Career Portfolio assisted the University in its re-accreditation process. In addition, efforts to transfer the system to other colleges and universities have been successful. These accomplishments are described in the next sections.

Use of the FSU Career Portfolio in University Accreditation

Electronic portfolios hold great promise as tools in support of the university accreditation process. In fact, some portfolio systems have been developed specifically for use by academic departments and universities in seeking accreditation or re-accreditation. While the FSU Career Portfolio was designed specifically for student use in support of career development and the employment process rather than accreditation, University academic administrators have found the ePortfolio to be a valuable component in the accreditation process. FSU is accredited by the Southern Association of Colleges and Schools (SACS) and a major requirement is to submit a university Quality Enhancement Plan (QEP). The QEP created by FSU is entitled, Leaders Educated to Make a Difference (LEAD; Wetherell & Harrison, 2004). The LEAD plan identifies 11 initiatives and Initiative #2, Development, Implementation, and Evaluation of LEAD Plans, specifically addresses use of the Career Portfolio in the accreditation process and LEAD plan. The description of Initiative 2 states:

“The Career Center is a unit of the Division of Student Affairs. It has designated staff liaisons with the majority of colleges within the university and some colleges/departments have peer liaisons as well. The Career Center recently launched an innovative program—the Online Career Portfolio. Using this resource, students are able to showcase the skills they have developed through coursework, research involvements, internships and work experience. The FSU Career Portfolio is an interactive tool that allows students to record, reflect upon and evaluate their experiences both in and out of class. The skill areas that students can develop through experiences in courses, jobs and other activities are leadership, communication, creativity, critical thinking, life management, research/project development, social responsibility, teamwork and technical/scientific skills. Career Portfolios will be an integral part of LEAD plans.”

The FSU Career Portfolio offers additional opportunities to support University accreditation in addition to its vital role in Initiative #2 of the QEP LEAD Plan. For example, accreditation rests upon evidence of institutional effectiveness and demonstration of student learning outcomes. In light of the inclusion of broad-based, universal skills applicable to all academic disciplines and the addition of student reflection in support of all experiences, the Career Portfolio provides added support in the accreditation process including: a) viewing the Career Portfolio as a developmental tool to assist students in creating individualized leadership development plans (LEAD Plans), b) the opportunity to request students to submit completed portfolios to be evaluated and juried by faculty as evidence of learning outcomes, c) viewing the Career Portfolio as a tool to assist students and faculty in translating the academic experience into skills and learning outcomes in all disciplines without being intrusive in curricular design or erosive to the integrity of a liberal arts education, and d) serving as a bridge between student and academic affairs.

In addition to university-wide accreditation bodies such as SACS, the Career Portfolio has been used in discipline-specific accreditation efforts such as ABET, Inc.—the US accreditation agency of college and university programs in applied science, computing, engineering and technology. For example, as part of ABET accreditation, the FAMU-FSU Engineering College required students to submit Career Portfolios. Other accreditation bodies such as the National Council for Accreditation of Teacher Education (NCATE) require student portfolios as evidence of effective teacher preparation. Often, discipline-specific
accreditation boards such as ABET or NCATE require very specific evidence of specialized skills beyond the general skills included in the FSU Career Portfolio.

In order to accommodate very specific skills in some disciplines, the FSU Career Portfolio was redesigned to allow students to add up to six additional skills. As a result, academic departments could direct students to add selected specialized skills as stipulated or required by accrediting boards. Furthermore, students could submit specialized career portfolios that follow accrediting board guidelines to their academic department and faculty for review. As noted earlier, the FSU Career Portfolio offers students the opportunity to create up to three versions. Currently, consideration is being given to designing an optional version of a Career Portfolio that students would submit with an application for faculty to evaluate and rate student competencies and/or learning outcomes within the portfolio system. Faculty-rated portfolios could then be submitted to accrediting boards.

Transfer of the FSU Career Portfolio to other Colleges and Universities

Another accomplishment of the FSU Career Portfolio is its adaptation for a state-wide system, and its adoption by two major universities. Due to these accomplishments, Florida State University has initiated marketing efforts nationally and internationally.

The FACTS Career Portfolio

As previously noted, the Career Portfolio was designed and developed by Florida State University staff and faculty and the University has submitted a patent application. However, FSU agreed to transfer the Career Portfolio, concept, design and supporting software code for use within Florida to a State-related organization—Florida Academic Counseling and Tracking for Students System (FACTS; www.facts.org). FACTS has an array of online applications to assist high school, community college, and public university students in applying and transferring to colleges, obtaining academic advising information, learning about financial aid, and accessing academic information and records. One application focused on career planning and, under a licensing agreement with FSU, FACTS created a customized version of the FSU Career Portfolio that is available for use by all community college and public universities in Florida.

The FACTS version of the Career Portfolio is housed and made available to students and colleges/universities through a server located at the University of South Florida. The FACTS version differs from the original FSU Career Portfolio in several important ways including: a) the system is a generic version and is not customizable by the various institutional users in Florida, b) the FACTS Career Portfolio is not integrated into the institutions’ databases which prevents students from including an academic transcript or view their courses directly while in the system, and c) other institutionally specific information cannot be included such as links to specific college, university and community websites.

While limited as a generic version, the FACTS Career Portfolio has been quite successful and has enjoyed widespread use throughout Florida. Clearly, an important factor contributing to the success of the FACTS version is its cost effectiveness, e.g., colleges, universities, and their students have free access to the FACTS Career Portfolio. Furthermore, since it is offered through FACTS, the Portfolio and student user is not identified with any specific college or university. As a result, the FACTS Portfolio is transferable as students attend new institutions. Through the agreement with FACTS, the FSU Career Portfolio now enjoys widespread accessibility and use by college and university students throughout Florida.

Adoption of the FSU Career Portfolio by Other Universities
In considering marketing efforts outside of Florida, the FSU Career Center was interested in learning about the transferability of the Career Portfolio to other specific out-of-state institutions. As a result, FSU transferred the Career Portfolio concept, design, and software code at no cost to two universities—The University of California, San Diego (UCSD) and the Georgia Institute of Technology (Georgia Tech). The Georgia Tech version is to be unveiled in the fall of 2006. UCSD has been exceptionally successful in re-designing and adapting the FSU Career Portfolio (http://career.ucsd.edu/sa/portfolio.shtml). Furthermore, UCSD is observing the same strong levels of student use as FSU.

**Licensing of the FSU Career Portfolio**

Recently, the Florida State University created a licensing agreement with Symplicity Corporation to create an ePortfolio system based on the concept and design of the FSU Career Portfolio. The Symplicity-based ePortfolio will be offered as an add-on module in their Career Services Manager system available in the NACElink recruiting software program marketed by the National Association of Colleges and Employers (NACE). Therefore, a Symplicity designed ePortfolio system based on the FSU model will be available to US colleges and universities through NACE.

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DIFFERENT TYPES OF EPORTFOLIOS TO SUPPORT REFLECTION AND LEARNING IN POST DEGREE COURSES

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Abstract

Last year, University of Macerata used two different kinds of ePortfolios in post degree courses. The first type of ePortfolio was designed according to the structure of Danielson and Abrutyn, revised by H. Barrett, and it was structured in three stages: Selection, Connection, Projection. Moreover, students have a personalized rubric and a blog. It has been used by 25 post-degree students for one academic year in 2004/2005, and in 2005/2006 it is used in another Master in Open Distance Learning, which is still running.

The second type, based on a free structure, asked the users to create their own path, adding a range of objects (files, links, notes), reflecting on their tasks and keeping an unstructured blog. 85 students used it in a three-month tutor training course.

This paper presents both types of ePortfolios and describes an evaluation of the two models. The evaluation reports the advantages and disadvantage for users, in order to develop useful outputs in terms of increasing reflection and fostering awareness.

Introduction:

Research on ePortfolios shows how different tools could lead to obtain various outcomes. G.Siemens (2003) observed that ePortfolios can be used as a hub to manage our participation and our learning. The benefits of ePortfolios could be summarized and classified into three main areas (Tosh, 2004): the first deals with the learning experience of the user, the second focuses on the institutions and their work for accountability, the third is connected with employment and professional development. Definitions of ePortfolios are often shifting among this different aims: as S. Grant (2005) stated sometimes the definition tends to “a collection of authentic evidence”, preserving the link with a traditional portfolio, in other case the core of the ePortfolio is the description of “a person’s learning, career, experiences and achievement” and allows the authors to reflect on their learning, communicate with other students, improve their learning path.

In our project “activity-reflection ePortfolio” perfectly defines the process aims. As C. Richards (2005) defined it, it is a strategy for teaching and learning which use new learning technologies in a student centred way (Jonassen et al, 1999) and according to Schon’s (1987) model of reflective practice, it supports the link between theory and practice. The learning process is not built up of information acquisition and skill training, but learning is seen as a dialectic process which involves a circular relation among initial familiarization, participation in a common practice and critical reflection (Wenger, 1989). Building an ePortfolio is an experience which ties theory, procedures and content learned with practical experience and collaborative work. In the structure of the ePortfolio the learner reflects on his past and take more responsibility for his/her own educational development, for his future (Rossi and al., 2006). As Wenger (2003) stated: “Because learning transforms who we are and what we can do, it is an experience of identity”.

Inside the ePortfolio, the following two main paths can be developed: the first tends to use the ePortfolio as an evaluation tool, useful for the teacher and for the institutions to map student knowledge, the second uses the ePortfolio as a learning tool, as a way to support the student and the practitioner in self-analysis and reflection.

This paper will describe two experiences of use of ePortfolios. They are both addressing the second path, as they would increase awareness and reflection of the students, but they show a lot of
differences, regarding the design of the tools and the format of the contents. Comparing the outcomes of the two projects, the paper will discuss some relevant issues related to ePortfolios use.

The experiences: descriptions of the case study

The first type of ePortfolio has been used in a Master in “Designing, realizing and creating on line learning environment”, a post-graduate online course run by the faculty of Education at Macerata University in 2004/2005. The whole course lasted for one year and the programme was run in a blended situation, with face to face lessons and on line collaborative work (Rossi, et al. 2006).

The structure of ePortfolio was designed according to Danielson and Abrutyn (1997), and H. Barrett (2004), but it presents slight differences: the whole learning environment worked as a repository and was used to collect all the learning materials and the students’ works. Inside the learning environment, in a specific sector called “Portfolio” three sections Selection, Connection, Projection, were used by the students from the beginning to the end of the course. Fig 1

The students were free to select the materials during the course, while connection and projection were completed in specific times, shared by the whole group.

One of the ePortfolio most important features is the use of a personalized rubric. To perform a personalized path and to enforce learners’ awareness, the course designers projected a rubric which contained all the task of the learning path. Every student was called to re-write the rubric, defining their own tasks and specifying on which item, in each phase, they meant to focus their attention; for every item the student was invited to explicit in which level thought to place himself. In this way every student had one personalized rubric as a point of reference, defined and elaborated on singular formative requirements and on the personal situation of the owner. In other words, such a rubric allows the learner to appreciate his own development by choosing the items on which placing attention, by indicating the level in which he could be placed and the further levels that means to catch up to short, but also to maintain his work and his history on a background that belongs to the community.

The ePortfolio was used with a blog, placed nearby the structure. This tool aimed to improve a personal reflection on the course itself and on the work in the compilation of the ePortfolio in a context free, lacking in rigid rules and duty to respect, that everyone could use and compile by their own requirements and their own learning styles.
The second type of ePortfolio has been used in a post-graduate on line course run by the University of Macerata to train on line tutors.

The course was run entirely on line and lasted for three months; it was quite different from the other course, and used asynchronous collaborative discussions and on line activities, as role playing and simulations. The course had 85 students, with great differences of age, job and education. Students were invited to fill in an unstructured ePortfolio, where they could insert their ideas and annotations in the various stages of the course. The tool used to insert the posts allowed the students to insert new versions of the comments and so they could check their evolution and improve submitted texts.

There was no time schedule to complete the ePortfolio, but each student could add reflection and annotated texts in every stage of the project. A blog was available as well, so that students could discuss with colleagues and share personal impressions and comments related to the formative project and to their personal and professional word. Adding materials to the ePortfolio was similar to the writing of a personal diary of the course, to put together new knowledge, problems and solutions, sometimes judgments and personal ideas tied to specific situations emerging during the collaborative work or the individual study.

As already cleared, both the ePortfolios addressed the objective to increase the awareness of the students in the fruition of the contents of the course and to promote a the building of a professional identity through a reflexive and self-evaluating attitude: assessment of learning in the two course has been supported from the analysis of the portfolios, but it has been carried out through “traditional” ways of evaluation.

**Evaluations and results**

The effectiveness of the two different ePortfolio approaches was evaluated in a number of ways by the team involved in the development of the course. The ePortfolios were read and analysed and messages from the forums and the blogs were compared with the texts inside the ePortfolios.

A number of issues come out of this first step of the analysis, and it is already being used to improve the course design and the ePortfolio itself for a second edition of the course which has started in April 2006 and is still running. Here follows the three main open issues: the foremost is the role of the structure in supporting the creation of the ePortfolio. The second is the ownership issue, and the role of ePortfolio in enabling student to take responsibility of their own learning and to manage their personal and professional development; related to this question is the role of the tutor/mentor to improve the quality of the portfolio work. The third is the use of the ePortfolio as a tool for the construction of the professional identity.

**The structure as a scaffolding strategy**

After the first reading of the ePortfolios, the designing team noticed that most ePortfolios of the first type consisted on reflection on materials and on the products of the students, while the messages of the second type were mostly referred to personal considerations and ideas.

As a consequence, the ePortfolios of the Master (first type) were substantially homogeneous; the students’ ePortfolios were similar in dimension, they showed deep reflection and reported a great number of well discussed comment.

On the contrary, the ePortfolios of the second type showed great differences among students’ work: some of the portfolios were rich in reflection and well structured, while others were poor and generic. It was not possible to retrieve a general rule, some of the works were based on the structure of the course, others on emotional issues and feelings. Reading this type of portfolio the author personal voice was the most evident feature, but the focus on the learning process was weak and sometimes absent.

Our conclusion is that the structure of the first type of ePortfolio (selection, connection, projection) worked as a guide for the student, and gave them a support to guide their work and to manage it offering a pre-defined frame of action and a specific time schedule for work implementation.
Thanks to the presence of tools guiding its compilation, a structured portfolio represents a kind of scaffolding for the student in the process of self-evaluation. On the one hand, this aspect is positive because it supports the growing of self-evaluation and self-regulation in learning; on the other hand, filling in an ePortfolio could be set among the “institutional” activities. Some students could perceive it as a compulsory activity or a teacher command; in order to overcome the above mentioned initial difficulties, the presence of a tutor-or a different referring person- is highly relevant for supporting and upholding the Portfolio first drawing phases.

On the contrary, although some students seem to prefer the lighter structure of the ePortfolio second type, the results do not really match with the expectations and the purposes of a real ePortfolio: sometimes the blog’s and the diary’s posts show an high inherent motivation, such as awareness of the significance in reflecting on and using a tool; in other cases the posts are often not so sticking to the learning process, wasting themselves in many different issues.

As previously mentioned, a “free” portfolio was used by the students in many different ways: that’s why we can see a higher usability from mature students, while less involved students, who are not so motivated nor experienced, could have more difficulties; for students at the first experience in this kind of activities, the approach to ePortfolio is easier if supported by the tool internal structure and by the support of a facilitator/tutor.

The role of the tutor and the ownership

During both the experiences the students were asked to complete their ePortfolios on their own. They knew that the teachers and the tutors will have read their portfolios, but the teachers and the tutors did not take a part in the previous work of the building of the portfolios. At the end of the project, asking the students to give comments about their learning experience, some of them told that a tutor higher involvement in the first step of the work would have been appreciated. If the final aim consists in giving the student the control over the content, the purpose and the process, he needs direction and scaffolding at the beginning of the process, when he starts developing his portfolio (Barrett, 2005). A continuative attention and a regular feedback on the content and on the implementation of the ePortfolio is an incentive and a motivating factor.

The growth of a personal and professional identity

According to Wenger (2003) the building of personal identity is a process of knowledge building and of applying the knowledge in the word: “Identity is a learned experience of agency”. To investigate the growth of a professional identity, the text included in the ePortfolios were analysed to detect the following items:

- Awareness of the strategies used;
- Reflection on effectiveness of the strategies;
- Analysis of the mistakes and of the problems
- Connection among theories and practice;
- Willingness in changing opinion and in assumption of new point of view
- Perceiving of their own professional identity and of the changes in the positioning inside the community.

In order to document how the students used the tool, we report here some quotations drawn from the portfolios of the Master, (Giannandrea, 2006):

*Awareness of the strategies used* - “...I have found particularly useful the “full immersion” methodology ... Through the laboratories, thanks to the presence of the teacher... I have been able to acquire new competences related to the creation of static and dynamic pages by using new software”...

*Reflection on effectiveness of the strategies* - “...the didactic approach has been focused on the group, with consequent valorization of relational dynamics. I believe that I have caught up the objective to
construct, in our group and in the period of stage, a community of persons animated from an intense collaborative spirit”.

The strong emphasis on the awareness of the leaning path made the ePortfolio a useful tool to improve the construction of the professional identity, as a student noticed: “This experience has changed my identity both at professional and personal level. Surely it has been one of the stronger formation moments that I have lived. I have acquired greater confidence in me, in my abilities and in my professional behaviour. It allows me to be surer of my choices and to transmit confidence also to the children. That has meant one greater knowledge of my characteristics, of my limits and a greater control on some aspects of my character”.

More often in the portfolio of the second type could be found personal and meaningful reflections, but hardly connected with the formative path and with the work of the community.

Another relevant difference can be found in the presence of elements connected to a critical thinking: in the first type of portfolio, the regards given by the students were very coherent to the learning path and the activities, but they were oriented to underline positive aspects, showing a real agreement with the course staff; in the second type of portfolio, polemic elements and high opposition against the course management and staff were often present, such as – in rare cases – some expressions of uneasiness towards other students.

Although it is not possible to generalize because of the contexts variety, we suppose that the lack of a fixed structure allows the author of the Portfolio to feel more open in conveying his/her own point of view without censorship.

**Reflections and conclusions**

The comparison between the two above mentioned experiences cannot be evaluated as a scientific research: the variables which have affected the students posts and reflections were too much and not so simple to be closed off.

However, the issues established by these experiences are modifying our ability in understanding an approach to ePortfolio, encouraging to deepen the research about some still critical nodes.

A final regard arises from the comparison between the two typologies: in the “structured” portfolio most of the achievements and observations are coherent to the learning path and to the activities, and aiming to keep a strictly working and professional level. In the “diary” portfolio observations and posts written by the authors overcome the course contents and include regards dealing with emotions, relations, personal issues, connected to oncoming expectations, professional and familiar personal growth.

Even this aspect seems to confirm the starting hypothesis according to which a structured portfolio helps and guides the reflection on the learning path, while on the other hand the “diary” portfolio seems to make easier all-accomplished deepening and personal reflection, not only in a merely professional and/or content-related field.

The analysis focused on the two model strength and weakness has granted the development of a working path, actually tested into a master in Open Distance Learning, which refers to previous experience improvements.

The aim behind the construction of an ePortfolio was to support the growth of a professional identity for each student: how to make easier and more efficient working with an ePortfolio for building our identities?

Another question to solve deals with the dialectic between “personal” and “collective” into an ePortfolio; the question is the following: how to connect a social aspect and a relational aspect fully respecting each author’s privacy? Is it more useful a personal, secret, self-biographical portfolio, or a “social” shared portfolio, enriching the community and the group building and modifying it?

The third critical knot consists in the support needed by the students; in composing an ePortfolio it is essential – especially in the starting phase – that the student feels supported both by the tool and by one or more referring person, giving information and motivation according to the work in progress
value. The designer should aim to be able to give a suitable scaffolding, together with giving the student the chance to let his voice emerge into the structure itself, tailoring his/her own ePortfolio.

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1. Theme and issues addressed

Theme #3 – Learning and Learners

Ownership - how can we ensure that owners take responsibility for their lifelong ePortfolios?

Learning Models - how can ePortfolios contribute to formal, non-formal and informal learning? Do different learning models lead to different types of ePortfolios?

2. Title of the paper/presentation and preferred mode of presentation

TITLE: Searching for e-Portfolio ‘Stickiness’: A Call for Development to Support the Select Process

MODE OF PRESENTATION: Work In Progress with presentation

3. Author and Presenter

Johnson, Glenn - Penn State University

4. Abstract

Overview

Empowerment is an especially critical aspect of meaningful student learning when it comes to Web-based electronic portfolios. For this reason it is important that future e-portfolio application development consider what influences a student’s sense of empowerment. This presentation reviews the e-portfolio development process with respect to support mechanisms, potential relevance to the user and empowerment as a means of measuring an application’s ‘stickiness’ from the perspective of the user. The author notes that the tools that support Select activities are sorely lacking. This presentation reviews those mechanisms already in place as well as suggests ideas for future development work.

Is it a floor wax or a dessert topping? Can it be both?

At a recent SUNY Conference on E-portfolios Michael Feldstein opened his remarks borrowing a line (above) from a Saturday Night Live sketch. This raises the question whether the potential e-portfolios has to offer stakeholders is getting spread too thin or in the wrong spots to be effective. Javier Ayala in a recent EDUCAUSE Quarterly article argued that, “…much of what passes under the rubric of student needs and concerns in relation to electronic portfolios is nothing more than an attempt to solve curricular issues that have plagued higher education for decades, the least of them being student learning” (Ayala, 2006).

Helen Barrett has also been tracking the evolution of web-based electronic portfolio systems since their inception and frames her description of e-portfolio tools by the extent to which they provide users with control of the artifacts, the activity and the connections within their e-portfolio space (Barrett, 2004). Barrett’s ‘red flag’ highlights her concern that assessment-driven versus open Web space approaches differ in the level of ownership that users attach to the learning that takes place. The underlying assumption here is that higher levels of engagement fostered by higher levels of student control promote meaningful learning and ownership of this learning by students. “Steady As She Goes” or “Hard to Starboard!”?
In what direction is current e-portfolio application development moving us? Is this the direction that we are interested in? What is driving the real purposes here? Is it learners and learning? Do students develop a sense of empowerment as a result of uploading artifacts into remote systems? Does evidence of competency completion promote lifelong learning? Is lifelong learning nurtured as a result of the filling of containers of an objectives matrix?

Some might disregard these questions as a dangerous generalization of the current state of affairs. To a certain extent I would agree, however, my purpose here is to raise awareness and target what e-portfolios require in order to honor its student-centered promise.

Ali Jafari specifies a formula for successful e-Portfolio deployment which lists ease of use, a sustainable business plan, an advanced feature set, a robust integrated technology architecture, lifelong support and transportability as the major factors upon which the ‘stickiness’ of the application hinges (Jafari, 2004). Jafari’s notion of ‘stickiness’ is intriguing, but what makes an application ‘sticky’ from the perspective of the user?

There is little research that examines either motivation or the implementation of e-portfolios yet these are critical to this notion of ‘stickiness’. A recent study explored the extent to which students value Web publishing skills and the extent to which these skills persist (Johnson, 2006). It was clear that students valued learning web publishing skills and that they used these skills on a regular basis afterwards. Moreover, the author argued that students’ perceived value of these skills impacts their engagement with Web publishing activities, which in turn, impacts deep learning. Empowerment is an especially critical aspect of meaningful student learning when it comes to Web-based electronic portfolios. For this reason it is important that future e-portfolio application development consider studies that focus on what influences a student’s sense of empowerment.

A Review of Supports for e-Portfolio Activity

e-Portfolio literature and initiatives internationally are fairly consistent in terms of the processes involved in developing an e-portfolio. At Penn State we have identified and promoted the following overlapping steps - collecting, selecting, reflecting and publishing evidence about what you know, can do and value. Other initiatives have also included connecting as a part of this process. In terms of e-Portfolio systems and the support mechanisms they employ how do these applications stack up when it comes to supporting each step of the process? What are the skills involved in each of these steps? Are there tools that support these skills? Let’s review:

Collect

Every e-portfolio system employs a mechanism which allows users to upload digital files.

Reflect

Journaling, blogging or being able in some way to attach personal narrative description and reflection to specific artifacts or groups of artifacts within an e-portfolio space are reviewed.

Publish

Sites that allow for free and easy web publishing without knowing multimedia skill sets are reviewed.

Connect

Social software such as del.icio.us or FOAF allows anyone to make connections between users. Other mechanisms are reviewed as well.

Select - Direction for Development Needed
An e-portfolio should provide or promote opportunities for making connections between:

- what is learned across different courses,
- what is learned in coursework and what is learned in out-of-classroom co-curricular experiences,
- what is learned across various experiences, and
- what is learned at the university and what takes place in the ‘real world’.

Tools to support this type of activity are sorely lacking. Moreover, the volume of digital files that students will be creating only exacerbates the problem!

In order to develop tools we need to articulate the skill sets that we want students to master. These skill sets include:

- information literacy – being able to critically evaluate information among different sources
- synthesis or integration of information – making connections between evidence and experiences
- information design – crafting a message for a specific audience and purpose

**Information Literacy**

**Directory Structures** - We need to do a better job in helping users assign personal meaning to digital files. The process needs to be more intentional and meaningful, tools that help users articulate differences between sources.

**Coaching** – ANGEL ePortfolio provides such help but also adds coaching by presenting questions such as “What makes a good artifact?”

**Synthesis and Integration**

Few system-wide features exist which facilitate making connections between specific artifacts. What are some mechanisms that support this aspect of Select?

**Matrices** – Learning matrices do a wonderful job of providing users with a framework or ‘big picture’ of work expected. What happens when these matrices become unwieldy. How does a student decide which artifacts are good candidates for attaching to a cell? Do matrices empower students, help them gain perspective over time or do they just serve the needs of the institution?

**Timelines** – Can the learning objectives matrix be presented in a timeline, at the same time including other experiences both in and out of the classroom? A semester, school year or lifetime view of evidence and experience would be a refreshing perspective that would support making connections over time.

**Rating / Prioritizing** – Amazon provides star ratings to help users regarding purchasing decisions. Could artifacts be coded similarly based on the learning objectives to help students categorize artifacts in the same way?

**Quotemark / Highlighting** – Journals or blogs, as they relate to e-portfolios, produce volumes of narrative. Could a “highlighter” be used to tag important phrases. Instead of bookmarks, might a “quotemark” tool help students link to essential phrases that they can use to quote themselves in summaries of important ideas or progress.

**Pop-up boxes / Thought Bubbles / Sticky notes** – Would mechanisms that allow users to assign sticky notes so that engaging in sidebar conversation is encouraged? ANGEL ePortfolio’s rollover capability provides for a quick peek of what an artifact is about – but only in the learning objectives matrix. Could we drag and drop thought bubbles on to images so that students could add ‘think aloud’ reflective comments to images in the spirit of “this is what I am thinking”?

**Information Design**
Templates – A helpful start but often are difficult to individualize and many argue that an open design space is a powerful learning opportunity that templates neglect. Does a lack of individualization detract from a student’s sense of empowerment? Does the use of an institutional template produce an e-portfolio for the institution or an institutional e-portfolio for the individual?

Elevator Speech Wizard – Consider the scenario where you are headed to the fourth floor and have about 45 seconds with someone of importance. What is your elevator speech? An e-portfolio can link to everything you have ever accomplished it is more effective to highlight your ‘top five’ artifacts? What makes a ‘top five’ and what do they say about the author?

How does this become ‘sticky’?

Why are we not finding innovative approaches to supporting relevance as a part of the e-portfolio process? We need to redirect our thinking towards the types of activities that students engage in and the skill set required to be successful. As stated previously, empowerment is an especially critical aspect of meaningful student learning when it comes to Web-based electronic portfolios. In supporting the skill sets used in the Select process, tools needs to be immediate and easy, but most importantly meaningfully relevant. Students that can critically evaluate evidence, make important connections and can craft their own personal message are empowered. The ‘stickiness’ will take care of itself.
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USING PORTFOLIO AS AN ASSESSMENT METHOD FOR ICT IN INITIATIONAL TEACHER TRAINING

Ulla Gjørling, UNI•

Background
The European Pedagogical ICT Licence (EPICT) is suggested as a comprehensive international standard for the continued professional development of teachers in the pedagogical use of ICT in education. The concept has been adopted by a number of countries and is being supported by the European Commission’s eContent program. The course mixes blended learning with team-based collaboration, and the content combines pedagogical knowledge of ICT integration with basic ICT-skills training.

Recently the approach has been implemented in initial teacher education with formal assessment in the form of digital portfolios and logbooks.

The objective of the Pedagogical ICT Licence for student teachers is to ensure that the student teacher acquires:

- Insight into the impact of ICT on the role of teachers and students and on the pedagogical and organizational development of the school
- Insight into the impact of ICT on the development of the subject
- Basic ICT skills
- Insight into and experience with team-based work in a net-based learning environment.

Context
The European Pedagogical ICT Licence is a concept for teachers’ professional development in the integration of ICT in teaching and learning. It was originally designed more than seven years ago for in-service teachers and has by now been attended by more than 80% of teachers in Danish compulsory education and adopted in a number of other countries. Over the years an increasing number of student teachers were subjected to the course during their training in teacher training colleges. However, the concept, the learning material for the course and especially the assessment methods applied were designed for experienced teachers with a pedagogical praxis and a background which student teachers do not possess.

Even though its developers repeatedly pointed out that the Pedagogical ICT Licence in its original form was not suitable for student teachers, it was continuously applied – primarily for lack of other relevant material to teach student teachers the pedagogical integration of ICT in teaching and learning. Taking the consequence of this continued use, UNI•C in our capacity as national coordinators began the process of redesigning and amending the existing course to fit the target group of student teachers.

Three major initiatives were introduced:

- The teacher training college must add a pre-defined paragraph about ICT in teaching and learning into their curriculum
- A certification procedure was launched for future evaluators within the teacher training colleges
- A portfolio assessment procedure was introduced as part of the course

During the four-year teacher training period the professors in the teacher training college will use the learning resources from the European Pedagogical ICT Licence (EPICT) in the various subjects across the curriculum. In addition to this all student teachers can access the learning resources individually from the course website. During the three years of study, the student teacher will collect a personal digital portfolio to document her ICT-skills, her competencies in the pedagogical application of ICT in teaching and learning, and her observations, thoughts and ideas about ICT in teaching and learning.
The portfolio documents three years of learning and an evaluator assesses it when the student reports the presentation portfolio ready for assessment.

**Objectives**

The objectives of the Pedagogical ICT Licence for student teachers are that the student teachers understand the importance of ICT for teacher and pupil roles and the influence of ICT on the pedagogical and organisational development of the school, and that they realize the innovative potential of ICT in the development of subjects. In addition to this the Pedagogical ICT Licence for student teachers should offer student teachers the opportunity to acquire a broad range of basic ICT-skills and make them experienced team participants in a web-based learning environment.

**Main area**

The Pedagogical ICT Licence for student teachers is divided into three main areas:

- Basic ICT competencies
- Research and collaboration with ICT
- Pedagogical and didactic ICT competencies

**Requirements**

The digital portfolio must document the student teacher’s competencies within the main areas mentioned above. In addition to this a number of requirements and recommendations apply. The collection of the digital portfolio must be a conscious and deliberate one thus covering at least one year.

The portfolio must contain at least two ICT-based products and one or more descriptions of learning scenarios that integrate ICT – these may well be produced and evaluated during teaching training periods of practice at school. Indeed, the portfolio must contain at least one piece of content produced during the student teacher’s periods of practice.

The digital portfolio must contain a number of ICT products which can be texts/articles produced for print, presentations to accompany speech, presentations that are interactive or time controlled. It may also be web pages, spreadsheets or databases. Digital video, images or other digital products are equally relevant.

**Reflections**

Each ICT product must be accompanied by a written log containing pedagogical and didactic reflections and contemplations that describe the learning processes experienced related to ICT in the teacher training college and during the periods of practice at schools. The log may contain text (reflections or descriptions of working processes) and images (photo, video, screen shots). It may also contain articles or products describing and reflecting upon pedagogical issues relating to the integration of ICT in teaching and learning.

The digital portfolio must contain a clickable index that displays the contents of the portfolio and it must relate the contents of the portfolio to the main competency areas documented by the portfolio.

The digital portfolio is assessed by a local evaluator, a professor at the college who is a trained facilitator within the realm of the Pedagogical ICT Licence and who is additionally certified to act as an evaluator with the Pedagogical ICT Licence for student teachers.

**Conclusion**

The Pedagogical ICT Licence for student teachers has been in operation in Denmark in one and a half year and is beginning to generate experiences and results in terms of usage. Using the European Pedagogical ICT Licence for student teachers is not without complications; however, the major
difficulties seem to rise from the lack of overall integration of ICT in teaching and learning in initial teacher training – not from problems pertaining to the course contents or the portfolio methodology. Generally, difficulties in the use of this particular programme in teacher training colleges seem to rise from subject teachers seeing it as a course that is separate from their own teaching and not as an integral theme/process in all subjects across the teacher training.

However, we do see students struggle somewhat with the overall understanding of the portfolio assessment methodology. But these problems primarily arise from difficulties formulating documentation of pedagogical praxis, difficulties formulating didactic contemplations, and problems thinking about teaching and learning on a meta-level which is necessary in the logbook and portfolio assessment method. This obviously requires a lot of introduction, training and understanding for student teachers as they have not become familiar with portfolio methodology during compulsory education.

In addition to this evaluators still experience an outspoken lack of basic ict-skills among students, which makes the process difficult. Statistics from one of the major teacher training colleges using this methodology shows that just one student handed in a web-based presentation portfolio. The rest presented a file and folder structure with a Word document front-page.

The portfolio methodology seems a valid approach to the complex assessment of the Pedagogical ICT Licence for student teachers, where assessment of students both on their competencies within ICT application in teaching and learning and on their ICT skills is needed. The flexibility of the portfolio methodology allows this. However, ICT skills and pedagogical competencies among student teachers are still at a level where they (student teachers) need substantial support both to reach an understanding of the portfolio methodology, to acquire competencies in the realm of ICT application and in ICT-skills related disciplines.

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ADOPTION STRATEGY FOR IMPLEMENTING AND USAGE EPORTFOLIOS IN INTERNATIONAL (GLOBAL) COMPANIES.

Mariya Gornostay, Kyiv National Taras Shevchenko University

Increasing requirements in changeable world.
We live in digital/multimedia age when information size becomes twice bigger every several years. New tools and technologies allow improving existing processes and expanding their usage for new areas. ePortfolio – is a solution which got new form thanks to multimedia. Its usability level increases day by day and creates a big opportunity for International companies’ management and concrete departments, as well as for all their employees.

ePortfolios: importance for employers.
There are clear needs in ePortfolios for employers – these solutions allow answering different questions:
- “How can I meet employees needs in their continuous personal development” – which is important for keeping employees interested in work continuation and bringing high results,
- “Which employee competencies are developed / need to be developed and how they reflect ideal competency set for each position in the company” – which is important for building team of professionals and finding right people for each position,
- “What areas should employer pay attention on when hiring people” – employer can choose what is important for applicants and can make applications containing most important information that will make recruiting process more simple,
- “How can employee productivity be increased and how (on which assignment) person can bring bigger value” – so employee and employer can build long-term career and development plans,
- “What are strong areas and areas for improvement for employee” – via getting feedbacks from peers, and many other.
So as you can see, ePortfolios allow to bring new breath into recruiting process.

ePortfolios usage – two cases.
Let’s review two cases of ePortfolio usage – within the company and outside of the company. The main difference between these approaches – is in purposes. Using ePortfolio within the company allows creating learning and career development plans for each employee and assess current level of skills and competencies. This is a tool which allows defining individual development and career plan for each employee.
ePortfolios usage outside of the company allows to gather information about knowledge and interests of potential employees. Also combined approach may be used which combines different purposes – what is really important for big companies which need to use ePortfolios to assess “health” within the company and to build strong recruiting process.

Adoption – first step on the way to successful ePortfolio implementation.
Apart from the benefits ePortfolio can bring, this is not a natural thing existing in International companies; it’s a product with its lifecycle which needs to be implemented to bring desired results. Adoption – is the key part for successful implementation of any new product within the company, and knowledge about adoption methods means not only successful ePortfolio implementation and bringing desired value but also possibility for continuous process and tool improvement which can bring more value.
The beginning of the road.

Adoption as a process starts from defining target auditory, users’ needs and choosing ePortfolio accordingly to them, and then developing optimal approach to deliver desired results.

First element of adoption strategy – is choosing solution or set of solutions for ePortfolio, or gathering requirements for solution development. Depending on chosen solution, this process may vary in details such as training content and set of competencies needed, while milestones are the same for different solutions.

Second element of adoption strategy – is definition of implementation scope. If company wants to use same solution for different entities (which are usually located in different companies), additional work may be required—like translation into different languages and also train advanced users which will lead adoption process in the region.

Third element of adoption strategy – is definition of target user groups. First of all, necessary to define different groups of users, and benefits for each group of users – such as 1) ability for employee to create own learning plan, 2) ability for HR department to get easy-to-use tool for selecting applicants, 3) ability for course owners to define interests of students and with assessment purposes. Also payment from users should be defined – time needed to fulfill portfolio, to gain new required for this skills etc.

But simply providing a solution doesn’t make it useful – we have to remember, that accessibility is not equal to usability, so adoption goal is to make usability as high as possible with increasing productivity for users and giving them new possibilities.

Key adoption factors and methods.

Adoption process is depending on different factors which should be assessed in advance as they are influencing on the whole process:

- Expected number of users,
- Level of skills users have (beginners/advanced PC users, beginners/advanced in multimedia),
- How all the questions (which are covered by ePortfolio) are solved now (e.g. manager is keeping offline profiles about his reports, employee/applicant is having personal web-page, HR department invites applicants to the set of interviews or make them by phone)
- Is it new solution or replacement for existing one (if replacement, it’s necessary to make comparison of solutions and define differences),
- How much users are interested in proposed solution and are they interested in making updates to their profiles on monthly basis,
- Speed of adoption

Big international companies can get more benefits from ePortfolios than smaller companies – because of scale and wideness. Using the same strategy for all entities, international company may build wide recruiting process through different countries, finding best candidates and proposing more abilities for learning and for career development. At the same time, implementation will take more resources.

Most popular adoption methods to be used in global companies:

- Communication:
  - Early communication describing overall ePortfolio and available functionality;
  - Detailed “how-to-use” from beginning to end instructions;
  - Newsletter (describe part of available functionality in each letter);
  - Posters
- Trainings:
  - Separate face-to-face training sessions for each target group of people (HR department, employees, trainers);
- Distance real-time trainings with on-line collaboration tools usage;
- Offline trainings prepared as manuals and presentations stored on ftp/web-sites etc.

All communications and trainings should contain links to created ePortfolios, filled with different purposes to give an overall understanding how they look like.

**Users’ segmentation.**

Users’ segmentation – is definition of target user groups based on different compelling reasons for ePortfolio usage. For example, following target groups can be chosen:

- HR department workers (for them focus should be done on ePortfolios usage for getting information about applicants and gathering statistics about employees interests and developed skills etc.)
- Managers (how can they use ePortfolios to manage employees expectations and interests etc.);
- Employees (how to plan further learning and improvement of desired competencies, how to request feedback from peers etc.)

It is very important to define small group of people who can become first adopters. In terms of such approach focus on ePortfolio benefits (like on-line, real time solution, which enables employees understanding, less turnover, saved time) is required as first adopters based on their experience can provide usage examples to other groups of people. First adopters are usually representatives of different target groups – so they can become trainers for their groups.

In parallel, focus on negative feedback prevention should be kept, so preparations for training for first adopters should be very thorough and benefits should be clearly stated. If early adopters are not using ePortfolio as it was planned, chosen solution should be revised before moving to another groups of users. From the other hand, it is very important to manage users’ expectations and clearly communicate what is required from them (like spending 1 hour of their time to fulfill portfolio, or necessity to attend separate training on multimedia usage). Also it’s important to state that if additional training required, users will obtain additional skills and describe ways they can use these skills.

Detailed training scenario should be created for each target group – to stay focused and consistent, separate training sessions are recommended as it was already mentioned.

Clear and focused communication, quality and focused trainings are the most important part of successful adoption.

**ePortfolios support model.**

Adoption isn’t a goal and adoption doesn’t end with achieved usability level. Adoption can not be successful if you will not think over the support model. So support plan should be developed which includes:

- Preparation of the document containing answers to most frequently asked questions;
- State clear steps and clear contacts for users in case they have issues / questions (like ask early adopters if you need to obtain brief training; ask person A for detailed training, ask person B if you have issues with loading web pages, go to following site if you have questions or proposals for ePortfolio community etc.)

Finally, it is necessary to collect feedbacks from the training and make periodical reviews with users. This will allow:

- Build live examples which can be used for the following training sessions,
- Track users understanding of ePortfolio solution and how to work with it,
- Define areas for improvement for further development, which is very important as solution may not take into account specific needs existing in the company; from the other hand, some processes may change and need to change some functionality provided in ePortfolio will naturally appear.
Conclusion.

There are several pieces of successful ePortfolio adoption: right solution and right questions to be asked to the right people which will show them usefulness of the solution. Right understanding of the solution by adopters should be accompanied by understanding of brought changes and “payment” from users’ side.

It is very important to create whole picture of adoption process before ePortfolio implementation, as it is easier to make quality focused training than break wrong users expectations caused by non-quality presentation. From this prospective, this approach is common for international and small companies, and it differs in terms of details and adoption purposes.

This work in process is focused on adoption process, its core elements and issues which are necessary to avoid while making adoption successful for global companies.

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ETHICAL PORTFOLIOS: SUPPORTING IDENTITIES AND VALUES
Simon Grant, independent consultant; Anna Grant, University of Bristol

Introduction

One of the main accepted reasons for using e-portfolio tools and technology is to support personal and professional development. Alongside this, the self-presentation aspect of portfolio use is now increasingly being recognised as an important means of presenting one’s identity to others. Given that values are a central component of people’s identities, and that ethical development is a vital part of personal and professional development, one might expect values and wider ethics to feature strongly in the e-portfolio literature. But though these topics have appeared in the literature of personal development, there is little evidence of them in the e-portfolio literature. The impetus for this paper is the recognition of this gap in discussion, research and publication relating the e-portfolio community to values and ethics.

The paper pursues a twofold approach to addressing the identified gap. First, it seeks to clarify the issues of relevance and interest in the field of ethics and e-portfolios. Second, it explores a particular area of interest, that of individual ethical development and the role for e-portfolio process and tools in it.

To help map out the field of ethics and e-portfolios as a whole, this paper begins with a brief discussion of the concepts ethics, values and identity. It also outlines the possible dimensions to explicating the issues of ethics and e-portfolios. The dimensions include the information about values of individuals, groups, communities and organisations that could be represented in a portfolio and the possible benefits of using ethics relevant information in conjunction with portfolio systems. The paper then considers the ideas of individual ethical development and multiple identities and outlines a generic developmental process that might be supported by portfolio tools geared towards ethics. Having done that, it provides an account of a concrete, step-by-step process that could be undertaken by using existing and novel e-portfolio functionality to contribute to one’s ethical development. The paper also briefly considers the systems implications of the proposal put forward in this paper by outlining an e-portfolio model for ethical development.

Most current e-portfolio practice, as well as unsupported personal development planning, assumes that people know what they want to do, or can assess their values based on reflection and questionnaires without immediate human support. This is fine for some people – those who are high achievers and feel in control of their lives. For others it is questionable, and even high achievers do not necessarily have an intimate understanding of their own values, and how these relate to the values of the people, groups, and companies they are involved with. An ethical portfolio approach aims to fill this gap by focusing attention on people’s identities and values. It is hoped that this will not only clarify personal goals, but help people find those goals which are most closely attuned to who they really are.

“Know thyself”.

Ethics, values, identity: the concepts

As ethics has not thus far been one of the topics explored by people engaged in conceptualising and implementing e-portfolio systems and practice, it appears meaningful to begin mapping the field by defining three key concepts – ethics, values and identity. For the purpose of this paper, a pragmatic understanding of what ethics, values and identity are about, and how they relate to each other, is called for. The brief definitional exercise that follows will be complemented later when discussing ethical development and managing multiple identities.
**Ethics**

From the academic point of view, Ethics is one of the main sub-fields of Philosophy. As a field of academic inquiry, Ethics or Moral Philosophy seeks to distinguish between what is good and what is bad, and what is right and what is wrong in more or less abstract terms. A distinction is made between formal or theoretical Ethics and applied ethics, where the latter draws on moral theories, principles and pragmatic reasoning to solve real world ethical dilemmas.¹

Since the mid 1990s an increasing number of academics and professionals in different fields, e.g. economics, public policy and corporate practice, have realised the necessity of introducing ethics to their respective fields. As a consequence, engagement with ethics is becoming less and less a sole occupation of academic moral philosophers and applied ethics is coming to the fore.

In its most practical form, applied ethics involves deliberation and choice between different, concrete courses of action in specific situations. In order to be meaningful, such deliberation and choice require awareness of relevant ethical considerations or standards. As Onuf (1998, 669) argues, “[e]thical conduct reflects what we feel we should or must do, given available standards”. The relevant ethical considerations may differ from context to context.

Applied ethics is central to most everyday professional practices, such as health care and business, even if practitioners in such fields would not engage in explicit ethical reflection. Health care professionals, for example, are frequently faced with the task of deliberating and choosing among a variety of options regarding how to treat individuals. Such options tend to have different, possible justifications and consequences, each of which might be argued to be ethical (or unethical) on some grounds.

From the point of view of individuals, concern with ethics can be seen as a central part of human “quest for dignity”, where ethics is about “trying to be decent”. (Coicaud and Warner 2001, 3) Onuf echoes this view by suggesting that the most important ethical standard is “honourable conduct”. For Onuf, everyday ethics “begins with the reasons we give for our conduct”. In his view, “[t]he reasons that people offer for their conduct must refer to the kind of standards that people always start with – the personally relevant, highly specific, frequently inconsistent standards that make their world inescapably their own”. (Onuf 1998, 669-670)

Everyday ethics is geared towards facilitating people to live together harmoniously. It places emphasis on the imperative of reciprocity among people while providing guidance on what count as good and what as bad ways of relating to other people. (Coicaud and Warner 2001, 3) What is seen as decent behaviour or honourable conduct in different cultures, spheres of society and specific contexts, such as a particular professional practice, has to do with the values underpinning the culture, sphere of society or practice.

**Values**

Specific ethics, i.e. more or less formally codified sets of beliefs regarding what constitutes good and right action, are essentially charged with values, where any code of conduct prefers certain values over others. Some values that are generally regarded positively include justice, love, friendship, tolerance, generosity, sincerity, and key liberal political values include freedom and equality.

For the purpose of this paper, it is important to understand how ethics and values relate to each other. Coicaud and Warner (2001) have identified three key roles that values play in ethics. First, values define what is good versus bad and right versus wrong, where ‘the good’ defined by specific values is based on “respectful interaction of people”. Second, values contribute to, and help us to engage in, “ethical mapping” of our world. Ethical mapping involves making distinctions and establishing hierarchies between “principles to abide by and ideals to aspire to” and “courses of action to avoid”. Values facilitate a reflective process through which we can articulate (for ourselves) “what we should be striving for, what we should be [cf. the concept identity] and what we should do [cf. the concept moral agency]”. Third, values such as justice or love both permit people to relate to themselves, to other people and the society in which they live in a “reconciled manner” and are the “the good exchanged in the relationship”. For example, mutually engaging with one another in a manner that

abides by the value of justice fosters an equitable relationship, making justice a good exchanged in the relationship.

Coicaud and Warner conclude about positive values with a very encouraging thought, which in part motivates us to pursue the idea of an ethical portfolio: “[E]xperiencing positive values has an inspirational and fulfilling effect on people, an effect that enhances the desire for and the possibility of a more ethical world geared towards opening up to others and sharing.” (Coicaud and Warner 2001, 3-4). It is reasonable to suggest that living a fulfilling life involves having a positive self-identity or identities. Opening up to others and sharing is about recognising other people for who they are and treating them in a respectful manner, while revealing part or all of our ‘selves’ in the process. These observations point towards a link between values and identity, which will be explicated next.

**Identity**

The concept identity is used in Philosophy and Social Sciences to signify that a person understands him or herself as separate and distinct from other people and possesses some degree of self-awareness. The notion identity refers to both a person’s image or mental model of themselves and individual’s characterisation of themselves with reference to a particular group, practice or idea(1). An individual might define themselves e.g. in terms of a family, a particular profession, gender, religion or a nation.

It is possible that people have several identities as opposed to one, dominant identity, where each identity can relate to a different aspect of a person’s life and/or personality. An example of one individual’s multiple identities with reference to the above mentioned “identity contexts” would be a mother, an academic researcher, a woman, a Greek Orthodox and British.

Identity is a relational concept or phenomenon in that it would be difficult to perceive how a person living in complete isolation from other people could possess any meaningful identity or identities. This observation brings one back to ethics and indicates a link between ethics and identity. The link has been articulated well by Coicaud and Warner: “Ethics forces each of us to feel that our identity is also defined by our relations to others. It is the experience that, somehow, we owe something to others and that our ability to handle what we owe to others decides is some sense who we are.” (Coicaud and Warner 2001, 2)

Each group, community, or other entity with which an individual identifies him or herself, either explicitly promotes certain values or perhaps more typically contains an underlying, i.e. largely unarticulated, code of conduct. Such a code of conduct or set of values define what constitutes good and right and what as bad or wrong behaviour in each of them. The values define what counts as ethical ways of relating to both other members of one’s particular group and people who do not belong to one’s group, e.g. how good citizens behave in relation to each other as opposed to treat non-citizens. As a consequence, values can been seen as a central component of people’s identity construction even if people have not, or are not always capable of, explicitly articulating the values central to their specific identities.

The major part of this paper explores some ways in which e-portfolio systems could be harnessed to support individual’s ethical development by helping people to articulate and reflect on the values “they live by” and would like to live by. Prior to taking up this subject matter, however, a brief overview of possible dimensions to linking ethics and e-portfolio thinking will be provided.

**Dimensions of ethics and e-portfolio thinking**

One of the objectives for this paper is to map out the field that emerges from the idea of “e-portfolio” standing for “ethical portfolio”. One useful dimension of this field distinguishes the view of portfolio as product – a set of information that has been collected, may have been selected, and may be presented – from the view of e-portfolio technology as enabling or promoting beneficial processes. A second useful dimension distinguishes the focus of both product and process: the set of information could be about the ethics of an individual, group, community or organisation; processes could benefit

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individual, group, community or organisation, possibly independently of the subject of the information.

Firstly here is treated the question of what information is or could be gathered related to ethics. This prepares for the more significant matter of the benefits which might be envisaged from using such information appropriately.

**Information about values**

It may be as well to note at this point that the discussion in this paper in no way assumes that any values are better, higher, or more ethical than any others. This assumption is followed through with the idea that tools to help manage values related information should be tools to help individuals make choices, not tools to promote particular values, or for indoctrination. One can use the term “ethical profile” for such information. An ethical profile of a person, group, community or organisation would be some kind of rating of that entity against a selection of values. The more widely recognised the values used in the profile, potentially the more useful such a profile could be.

**Information about the values of individuals**

Many approaches have been been tried to trying to ascertain or describe an individual’s ethical position, or their personally-held values. However, it would appear that there are no well-known initiatives which seek to represent this kind of information in any machine-processable form. If there is any normal practice, it seems to be no more formal than individuals writing a piece of free-format text about the values they hold. Even this is not easy in the context of recruitment, because of both the common desire, and associated legislation, to avoid discrimination on the grounds of religion or creed.

Some examples of constructing a personal ethical profile rely on a relatively simple self-rating approach. The work values inventory at Saint Anselm College asks reader to decide on the basis of present reflection what values are important to them. An issue here is that people often are less clear about their values in the abstract, and more consistent in their actions than in their words. Nevertheless, this seems to be the current norm for career-centric values analysis: Arizona State University has is another example of the same general type. There are certainly many others in the context of careers advice and planning. Another self-rating inventory intended to help with life decisions more generally is the Life Values Inventory.

One particularly well-detailed values inventory, intended for a wider use than just careers, is the Hall-Tonna Values Inventory. Because of the many value concepts used (125) the approach is through questionnaire (or “instrument”) rather than simply self-rating. It is used by several consultants, e.g. HT Hall Associates (which includes one of the originators) and the Mineness Group.

One emerging challenge is the question of how to evidence information about individual values which emerges from such questionnaires. This might be more difficult, the more finely detailed the value concepts are. Meeting this challenge invites comparison with existing e-portfolio practice of evidencing skills or other personal qualities, and will be taken up briefly below.

Another significant challenge is to relate individuals’ values as revealed by and represented in any kind of test to values as applied in any other domain. For example, if one discovers one’s profile according to the Hall-Tonna inventory, how can this be used to select an educational institution or an employer which will be in harmony with these values? This would require some kind of profiling of an institution, a course, an employer, or a job, and then matching two profiles together. This challenge is not taken up in this paper, and remains for further work.

Another avenue to explore is the way that many people indicate their implicit values in terms of particular people or groups. When people admire someone else, when they express the feeling that they would like to be someone else (or “in their shoes”), or even when they count someone else as a good friend, it seems plausible to suppose that at some level they perceive some sharing of values with

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3 [http://www.anselm.edu/administration/CES/WorkValues.htm](http://www.anselm.edu/administration/CES/WorkValues.htm)
4 [http://career.asu.edu/S/careerplan/selfdiscovery/ValuesAssessment.htm](http://career.asu.edu/S/careerplan/selfdiscovery/ValuesAssessment.htm)
7 [http://www.minessence.net/](http://www.minessence.net/)

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that other person. To be the object of admiration, the other person does not have to be alive, or even historical: they could be fictional. This kind of information would probably be easier to elicit than direct reflection on explicit values, from some types of people.

Also plausible is the hypothesis that people feel more comfortable in a group, the more values they have in common with it. Thus, recording which groups an individual feels most comfortable in might be an indication of their values, if the values of the group can be established.

Information about the values of groups

Much has been written about group values from the perspective of Social Psychology. Because small and informal groups rarely have any kind of portfolio presence, there remains a challenge to explore how groups might represent their values. They may or may not use group portfolios for representing group values. This needs to be done in such a way both that the values can be read and understood by the individual members of the group, and that the values can be integrated with any e-portfolio tools they may use. To be most useful, group ethical profiles would need to use the same value terms as would be used in other ethical profiles.

Information about the values of communities

There seems to be little by way of attempting to represent the values of communities in a structured way. But there are some clearly recognisable examples of situations where certain values seem to be expressed in the context of a community. Consider the campaigns or movements for local government areas to be nuclear-free, or fair trade. At an even more local level in the UK, there are Neighbourhood Watch groups.

These kinds of values can be expressed in promotional material for local government, for example in attempts to promote an area as desirable either for investment or for people to live in – both of which would potentially increase local government revenue.

To represent the values of communities in a way that is useful across various applications, there would need to be some standard list of values (perhaps in terms of principles or causes) that could be expressed at a community level, and standard approaches to what adherence to a cause should imply. Such an approach already exists for “Fairtrade Towns” (the term includes any populated area). If the implications (in action) of a community value are clear, that should help towards ways of verifying that a community actually abides by its claimed values.

Information about the values of organisations

When we turn to business and government there is a profusion of interest in and writing about ethics. The field of “corporate social responsibility” is well-developed, and many organisations are concerned at least with avoiding the scandal and ensuing collapse which can be brought about by practices which may be judged unethical – or, for that matter, direct demise which can follow financial malpractice.

Beyond the desire to avoid scandal and collapse, values play a part in the image of a company, or of brands belonging to a company. The problem is that it is difficult to verify whether an organisational claim to adhere to principles is actually reflected in practice. If verification is attempted at all, it is normally delegated to specific agencies. Agencies such as the Soil Association (to do with organic food) and Fair Trade labelling organisations already have verification programmes for consumer products, while it is possible to imagine other high-profile organisations such as Amnesty International (to do with human rights) or Transparency International (to do with government corruption) verifying governmental or corporate practices.

With regard to information about the values of governments around the world, there are a set of related norms guiding the actions of all states. Today, among the members of the society of states it is seen as good to respect the sovereignty of each other, where intervention (military or otherwise) might only be

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8 http://www.fairtrade.org.uk/get_involved_fairtrade_towns.htm
9 http://www.soilassociation.org/
10 http://www.fairtrade.net/
11 http://www.amnesty.org/
12 http://www1.transparency.org/
justified on humanitarian/human rights grounds, genocide being the clearest case. Other key norms of
the society of states, embodied in the United Nations and other key international organisations, include
self-determinations of peoples, democratic institutions within states, economic cooperation, collective
security, international law (including the laws of war) and anti-imperialism. The collection and
verification of information relating to these norms, i.e. providing evidence of actions that promote or
undermine them, poses a challenge as there are multiple actors acting in the name of most states,
formal governments being just the tip of the iceberg. Different UN agencies, Amnesty International
and Human Rights Watch, among others, are trying their best in gathering such information. (See e.g.

Thus, the ethical information available about organisations tends to be a mixture between small areas
of formally-assessed status, and promotional material which typically has neither formality nor
reliability. The concept of a portfolio applied to this kind of information would at least imply that
claims by organisations to hold particular values could be supported by evidence, and that evidence
might be able to be delivered on demand – effectively by click on a Web link – to those who had the
time and the interest. A rating or reputation component could then provide the facility for feedback on
performance, reducing the likelihood or success of baseless claims.

Summary of information about values

The emerging picture is very patchy. Information about values, whether of the individual, an
organisation, or a community, is only likely to be reliable when there are quite clear methods of
assessment, and where this assessment is performed by a competent and independent body. Where this
is not the case, it could be taken as baring ethical judgements on hearsay, or the unproven opinion of
an interest group.

Before an ethical profile can be constructed, some recognisable values have to be selected, as well as
ways of rating people, communities or organisations against those values. While this is relatively
straightforward for certain well-defined areas such as organic produce, to agree on definitions of
values, and description of norms derived from them, will need great and continuing effort from
organisations and individuals.

The opportunity is then to introduce portfolio practice for values in a similar way to portfolio practice
for skill and competence, and to work on developing possibilities for informal as well as formal
assessment of values and norms, alongside self-assessment backed up with a portfolio of evidence.
The motive for this must be that some good will come out of the use of this ethical portfolio
information, and it is to that we now turn.

Plausible benefits

Looking again at our three areas of the individual, the organisation and the community, one can
envision benefits from the use of ethics relevant information in conjunction with portfolios. An
organisation could plausibly benefit in several ways, and these could include the use of such
information relating to individuals, as well as organisations. For example a retail business might well
reckon that its business would be improved by managing ethics relevant information about its
customers – such as the extent to which they valued organic or fair trade goods. Indeed, perhaps some
large retailers have started down that path already. A community could benefit from transparently
promoting coherent values among its associated people and organisations, through making that
community a better, more trusted place to be.

To investigate such benefits further would be a major undertaking, and this paper focuses on the
possible benefits to the individual. Not dealt with here is the application of ethically-related
information to ethical investment, to the potential benefit of both individuals and organisations.

In particular, the remainder of the paper focuses on the ethical development of individuals, as this is
relatively close to the established area of personal development through e-portfolio tools. After
considering the role and purpose of e-portfolio tools in ethical development, this is linked with values
and identity. But different people tend to deal with the central issue of managing their identity, and
representations of themselves, in different ways – this is exemplified by the contrast between the
positions associated with Goffman and Jourard. Bearing this in mind allows better consideration of
what features of e-portfolio tools could best support representation of identity and values, and support ethical development. The paper goes on to look at a plausible approach to an ethical development process using e-portfolio tools, and finishes by considering the systems requirements implied by this kind of process.

**Individuals’ ethical development and multiple identities: What role for e-portfolio tools?**

The possibilities for representing information relating to individuals’ personally-held values by using e-portfolio technology were outlined in the previous section. This section focuses on explicating what ethics related purposes such use of e-portfolio technology could have. To achieve this aim, the concepts of ethical development and ‘moral agency’ are introduced. The view of identity as related to ethics is extended, covering the previously introduced notion that people hold multiple identities.

**Ethical development**

In one current conception, e-portfolio tools are seen as a means for supporting and celebrating learning and maturing by individuals in both formal and informal contexts. This can be seen as a positive and empowering use of e-portfolio technology. The most typical formal contexts are educational institutions, where e-portfolio tools are mainly used to support personal development processes. Such processes have so far typically not included the recording of, and reflection on, one’s values or explicit consideration of ethical issues, which are central to what this paper sees as ethical development.

The lack of engagement with ethics is perhaps in part due to the fact that formal education tends to leave this kind of development to take place through maturation. As a consequence, in order to look at ethical development one needs to look primarily at maturation rather than formal education. Even within the highly formal context of Harvard in the 50s and 60s, Perry (1970) charted his views of ethical development as being largely outside the scope of the formal educational programmes of the time. In keeping with this, the present paper involves looking positively on the idea of e-portfolio related technology being used independently of formal education.

If ethics is essentially about trying to be decent by distinguishing right from wrong and acting accordingly, what might individuals’ moral maturation or ethical development involve? Especially when young people are concerned, two important, related forms of maturing can be discerned, both of which are ethically relevant. The first is individuation, and the second is increasing recognition of oneself as a member of various communities, a particular society and/or wider culture.

On the one hand, individuation (a concept notably used by C. G. Jung, among others) entails becoming aware of oneself as a unique person with specific characteristics and interests. This goes along with an increasing wish to explore and develop one’s individuality, whether through one dominant identity or with multiple identities. Some examples of identities that a young person might hold simultaneously are a university student, scientist, Roman Catholic, Italian, athlete, heavy metal fan, and supporter of Juventus.

On the other hand, comprehension of oneself as a member of various communities, a particular society and/or wider culture involves understanding what counts as meaningful, acceptable and desirable conduct in each of them. As was stated in the section on the concept identity earlier in this paper, the groups, communities or other entities that individuals identify with either implicitly or explicitly promote some set of values. It is possible that what counts as acceptable or desirable conduct in one such group, community or ‘practice’ is not acceptable or desirable in another. In other words, there may be an inherent conflict between the values underlying two separate practices. For example, some heavy metal band that a person admires and identifies with might undermine values central to the same person’s Roman Catholic faith. Such conflicts can result in internal ethical tension within individuals. (See Frost 2003, Rouse 2001, Walzer 1994)

The view put forward in this paper is that managing one’s multiple identities and memberships of various communities, including resolving possible ethical tensions arising from them, could well be supported by e-portfolio tools. Encouraging and supporting individuals in such endeavour is important because it is central to people’s ethical development, or, to use terms common to Moral Philosophy, their development as ‘moral agents’. 

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To be a ‘moral agent’ involves being capable of engaging in ethical deliberation, choice and action. Ethical deliberation involves explicitly recognising what values different courses of action might uphold and promote, including the consideration of the possible consequences of specific actions or persistent patterns of behaviour. It also encompasses being aware of any values or ethical standards that underpin the practice within which the action in question falls. While this is seen as an ideal, all humans possess the potential to understand and respond to ethical reasoning and to choose to act in an ethical manner (however defined in specific situations). However, such human potential needs developing. (See e.g. Coicaud and Warner 2001) It is suggested here that there is a role for e-portfolio tools in such development processes.

Managing one or more identities

As has already been implied, developing as moral agents or promoting individuals’ ethical development is not necessarily a single-track affair. Some people at some stages of their life incline towards managing various, more or less separate identities or personas. This is a position often associated with the work of Erving Goffman (e.g. Goffman 1959). Others prefer to pursue consistency and self-disclosure across contexts, as represented in the work of Sidney Jourard (e.g. Jourard 1971). In either case, the individuals may or may not be aware of the values underpinning the key entities in the context of which their identity is constructed. Both types of people could benefit from e-portfolio tools and related processes helping them to reflect on and articulate such values for somewhat different reasons.

The first kind, who wishes to maintain several separate identities, would be supported in maintaining or managing such distinct ‘selves’, while getting the chance to identify any tensions between the values underpinning their different identities. They would be encouraged to seek to resolve such ethical tensions without having to give up any of their identities or to pursue self-disclosure across contexts. The second type of person, engaged in self-disclosure throughout their lives, is naturally motivated to pursue a consistent set of values across the board. “Ethical portfolio” tools would help them to become more aware of their core values, to discern what kind of action and choices upholding their values might involve, and to indicate when their core values might conflict with the dominant values in a particular group with which they may wish to engage.

It ought to be noted that in reality it is clear that the polar opposites of Goffman’s and Jourard’s positions are extremes of a spectrum, where everyone occupies positions somewhere in between. Nonetheless, the above proposed uses of e-portfolio tools to work with information regarding values could benefit people situated anywhere on that continuum. All types of people would be likely to benefit in the form of support in refining and elaborating their explicitly held values and corresponding behaviour.

Summary of role for e-portfolio tools

At this stage, two key general points about the role of e-portfolio tools in ethical development may be discerned. The first point is that, however an ethical profile information may have been gathered in the first place, e-portfolio functionality will mean that it is available later to help with ethical development related processes. An example of such a process will be discussed shortly below. The second point is of a subtly different nature. Whatever the developmental processes that use the information, the fact of having values explicitly recorded will tend to raise the awareness of those values in the individual mind. When that awareness is raised, the individual is likely either to become more conscious of their core values across their life (following Jourard) or more aware of the different values attached to different identities or contexts (following Goffman). Thus it can reasonably be suggested that the simple fact of having values represented by an e-portfolio system is likely in any case to contribute to individuals’ ethical development.

Before suggesting an e-portfolio model for ethical development, which involves working out the systems implications of the proposal put forward in this paper, some considerations regarding an e-portfolio process and activities amenable to ethical development are required.
E-portfolio related process to support ethical development

This section outlines one possible view of an overall process of ethical development, which could be supported by e-portfolio tools. This is intended to be illustrative, and not definitive.

Grant et al (2004) proposed a model of “personal theory building” with skills in mind, and much of this approach can be transferred to values. The information on which to base personal ethical development can be gathered in the same way as for other personal development supported by e-portfolio tools. What is essential is a practice of recording salient aspects of events in which the individual is involved. This can be formalised, for instance, as a learning log. Much of established personal development practice focuses on skills, and for that it makes sense that, when recording experiences, the system prompts in terms of skill-related concepts. Instead, for ethical development, it will be useful to have prompts that draw attention to the values and wider ethics related aspects of experiences.

Good prompting questions will need to be designed carefully, but an example of some rough ideas might be “did you see someone doing something you really admired?” or “did you feel guilty or uncomfortable in yourself about something you did?” or “did you notice anyone expressing approval or disapproval of some activity?” or “did you feel that someone else did something wrong?” Prompting questions would be built in to the e-portfolio tool. Material to inform such questions could be drawn from applied ethics, from moral education, and from “personal qualities” strands in existing personal development systems. These relatively raw records – of personal reactions to the ethical aspects of life experiences – form the natural raw material for later reflection, and they would be stored by the e-portfolio management system.

A next step in this process would be to analyse the experiences into some categories. One level of categorisation (not the only one) would be to analyse the values implicitly or explicitly associated with the experience. This could be done informally, without an analytic scheme, but probably it would be easier to take forward if there was some predefined structure. Actually devising a convincing scheme is not easy or straightforward, but it should cover values which the individual recognises as significant to him or herself. Schemes with very few items might not give a useful record, and schemes such as found in the Hall-Tonna values inventory (mentioned above, with 125 value concepts) may be rather complex to use directly. A different approach would be to devise a personal analytic scheme with the help of Personal Construct Psychology (Kelly 1955), but the challenge here would be that it would not be shared with other people. LUSID (Strivens & Grant 2000) is an example of a PDP tool that is based around analytic schemes for skills. It could be very easily adapted for this kind of use by adding a series of analytic questions and concepts focused on values and related ethics.

Another level of categorisation would be in terms of the context of the experiences. As has been noted above, different contexts can be associated with different groups of people around the focal individual, and these different groups of people are likely to have sets of implicit or explicit values, and codes of conduct, which differ from one another. Ethical analysis is likely to be fruitful only when these different contexts are distinguished, and experiences from each context grouped together. This is a salient feature in young children’s development, when they learn to distinguish the different standards of behaviour appropriate to home, school, shops, playgrounds, grandparents, friends’ houses, holiday, etc. But at this early stage, what is being learned is simply what counts as acceptable behaviour in these different contexts, rather than any explicit understanding of the values which may be involved. People only slowly, if at all, adopt standards of behaviour which apply across contexts.

The next logical step is perhaps the hardest to envisage in the abstract. It is the process of discerning patterns in the recollected material, which can then lead on to an advance in the individual’s self-understanding regarding their values. What sort of patterns could be envisaged in reflection for ethical development? Patterns in other people’s actions could lead to theorising about the values they hold; appreciation of patterns in one’s own actions and responses could lead to potentially “new and shocking” (Eliot 1940, II) understandings of the values expressed by one’s actions which may be in conflict with the values associated with one’s overall self-identity or any of one’s several identities.

The stage is now set for the individual to elaborate the understanding of the values they hold, which one imagines can be regarded as developing in some way, however great or small, as a result of this overall process. Along with the increased awareness and understanding, the e-portfolio technology
should be able to store the new ethical profiles, which may be associated with several identities. Moreover, it could potentially link up with other systems and tools that can use the ethical profiles to help the individual make ethical choices.

This can be seen as an end-point for this part of the ethical development process, but of course it can be the start of new patterns of action. The reconsidered values can indeed be fed back into existing careers planning processes, but there is much more potential. To the extent to which the ethical profiles are based on common terms, such profiles could play a part in systems guiding an individual to ethical consumer or investment choices, to leading the individual to associate with other people, groups or organisations that have values in common with the individual. Beyond traditional careers guidance, there is the potential for recruitment systems to take individuals’ values into account, in matching the individual with potential employers who, again, have values in common.

**E-portfolio model for ethical development**

The process described above has implications in terms of requirements of a system to support that process. These are addressed now.

Part of the essence of any e-portfolio system is to help manage the storage and recall of personally-relevant information, which may be of many kinds. Increasingly the storage of e-portfolio information is seen as being distributed, potentially across many servers: some belonging to educational institutions or employers, and others involved with social and networking Web systems like blogs or services like MySpace.

The bulk of this information can be left where it is, while overlays or superstructures of personal connections, associations and significance – including ethical significance – could well be represented by systems using the Topic Maps standard. The Topic Maps web site\(^{13}\) acts as an index to this ISO standard way of representing knowledge. Steve Pepper\(^{14}\) describes Topic Maps as a “standard for describing knowledge structures and associating them with information resources. As such they constitute an enabling technology for knowledge management. Dubbed ‘the GPS of the information universe’, topic maps are also destined to provide powerful new ways of navigating large and interconnected corpora.” Extensively used e-portfolio systems could well result in a large corpus of information for each individual.

The raw information by itself, while much of it would be relevant to personal values, would not contain those connections that most essentially signify personal meaning. Because this information, held on various servers, would not be too closely tied to self-identity, people would have relatively fewer worries about their identities being revealed more widely than desired. Information of genuine personal significance, held in the Topic Maps superstructures, would be relatively easy to control by the individuals who are implicated. This kind of technological approach can be seen as helpful in securing people’s involvement with recording values-related information.

The main point to put across at this stage is that an ethical portfolio approach does not imply specific tools or techniques, but rather is based on the assembly, storage and reuse of ethical profile information potentially across several contexts.

On the one hand, for people inclined towards the position characterised by Goffman, this kind of e-portfolio technology can be used as a means of organising personal information into categories relevant to the various identities or personas, and of managing the boundaries between these. Among the information that could be sorted in this way are the values espoused for each identity. On the other hand, for those more amenable to Jourard, an e-portfolio management system can be used as a means of promoting consistency and coherence of the disclosure of personal information in general, and values in particular.

The current e-portfolio systems closest to satisfying the requirements of ethical portfolio use are probably those that already allow people to record their own skills or competencies, to assemble evidence for them and to present the claims and evidence to others. In addition to their capabilities at

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\(^{13}\) [http://www.topicmaps.org/](http://www.topicmaps.org/)

\(^{14}\) [http://www.ontopia.net/topicmaps/materials/tao.html](http://www.ontopia.net/topicmaps/materials/tao.html)
present, such e-portfolio management systems would need to add the capacity to represent values alongside skills, perhaps defined outside the system, and also some way of grouping and categorising activities, goals, etc. as well as values into different contexts which could be associated with different identities. Given these additions, the common functionality of selecting material for presenting to different audiences can be reused to good effect.

Though the technical side of building ethical portfolio systems is not difficult, the pedagogic side appears to be more challenging. How can practitioners and developers together work these tools in to systems which effectively help people’s ethical development? While outlines of possible process have been given above, the devising of detailed implementations of these processes is not at all obvious, and is especially challenging if it is desired that the tools work independently of human support. It will be interesting to see whether the growing field of mentoring and “life coaching” can take up this ethical portfolio approach.

Moving from the individual to the group, it is traditional wisdom that the values of the groups of people with whom an individual associates are formative of the values of that individual. A full e-portfolio model for ethical development needs to include provision for group values to be represented, and those values to be available to the ethical portfolio tools used by individuals. One approach to this, yet to be explored in any depth, is for groups and small communities which use ICT tools to maintain an explicit ontology of their domain – again this could use Topic Maps as a representational standard. While it is certain that many people would not be interested in the concept of ontology, they might well all recognise that there are some things that are the accepted subjects of communication within the group, and other things that are marginal. The challenge would be to integrate values into such ontologies.

**Conclusions and further work**

The arguments promoting e-portfolio approaches have tended to neglect values and explicit engagement with ethical considerations. Major dimensions of relevant issues have been set out, which are seen as having potential for informing further research and development. The paper has argued that personal ethical development is one area in which individuals can benefit. An e-portfolio approach to representing personal and personal-related values could support ethical development, and at the same time serve as a basis for managing the information most closely connected with individuals’ self-identity or multiple identities.

Technology for representing values and for supporting ethical development would ideally allow individuals the greatest control possible over their personal value-related information. This could be achieved through separating the bulk of portfolio-related information, on servers across the Internet, from lightweight Topic Map representations of value concepts and their relationships to the rest of the portfolio information. The values related information would then be able to be particularly closely controlled by the individuals concerned. The e-portfolio technology also needs to support the representation of different contexts in which different identities can be presented, and the association of experiences, goals, etc. with those contexts of identity.

Further work is needed to detail realistic provisional scenarios of ethical development using e-portfolio tools. These scenarios need to be compared and contrasted with other, existing scenarios of personal development using e-portfolio tools to clarify the value added by the ethical portfolio approach.

More work is also needed on the understanding of how groups can use ICT systems to maintain representations of their own values and codes of conduct, in a way that will be recognisable and usable by the individuals who are associated with those groups.
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Theme 4:2: Implementation

Title: A 360 Degree Review of e-Portfolio Assessment

Preferred format: Full research paper with presentation

Author: Gunn, C.

Context
The use of electronic portfolios for assessment of student learning is a common area of focus that cuts across curriculum design, educational research and system development initiatives in the current higher education context. Generally speaking, there are two different ways of approaching the concept of portfolio assessment. One is an electronic and, by implication, efficient means of collecting different types of evidence that focus on learner achievements within a well-defined course of study. A broader focus within this ‘evidence collection’ approach might extend the scope to a cumulative portfolio featuring lifelong learning and career development of an individual. The main benefits of this approach are considered to be the range of evidence formats that can be presented, efficient storage and retrieval, and the flexibility to choose artefacts that best represent aspects of individual achievement whatever format they may exist in. With current online storage and access capacity, the possibilities are extensive. The other approach serves a similar function in terms of evidence collection, although this consideration is secondary to the portfolio acting as a catalyst for student choice from a range of course and assessment options. While the first approach can be applied within the context of strictly defined course prescriptions and traditional forms of assessment such as essays, assignments and examinations, the second approach implies significant curriculum reform and revision of the structure of degree programs. The ‘portfolio driven’ approach potentially supports flexible degree structures that can be tailored to the interests and learning goals of individual students. This option readily supports the use of a wider variety of learning and assessment activities. Like online learning management systems or virtual learning environments, the software matters less than the educational design and the teaching and learning processes it supports. Software must be reliable, easy to use, conform to interoperability standards and flexible enough to accommodate a common range of file formats and access options. A number of open source and commercially available products now satisfy these needs.

The concept of a flexible program based on portfolio assessment, however, represents an innovative approach to curriculum design and assessment for many universities. It is particularly challenging for institutions that have opted to maintain more traditional approaches to teaching, learning and assessment, and to those now responding to financial pressure by increasing class sizes and downsizing staffing budgets. While there is no doubt that technology can be applied most effectively to support student learning that is based on a mass lecture model of instruction, the question must be asked whether this model will prove to be sustainable when other, possibly more attractive alternatives are available. The traditional appeal of the older universities may be sufficiently strong to weather the current storm, though the demands and capabilities of digital natives brought up in standards based assessment environments suggest otherwise. The ever-increasing pressure on academics and the demand from professional communities’ for work-ready graduates are further negative influences. Analysis of the current context suggests that a system that has survived relatively intact for centuries may now need to consider altering its traditional ways. A steadily growing collection of research and published cases cited in this study supports the argument.

Objectives
This paper offers a 360 degree review of the concept of portfolio assessment that may assist teachers and institutions to:

- Review the continuing relevance of established program structure and teaching, learning and assessment strategies;
- Develop options for curriculum change and implementation strategies that meet the demands of contemporary society and work within the current higher education context;
- Critically assess the educational design, process and outcome implications of different approaches to portfolio-based assessment.
Practical examples of the use of portfolio-based assessment are used as the means to illustrate the relevance of principles identified in the 360 degree review.

A 360-Degree Review
The changing context of higher education in the early years of the 21st century sets the scene for this investigation. The increased percentages of national populations going through higher education in many countries is a well documented phenomenon, as is the increasing range of educational institutions, courses and discipline areas served. The limited ability of traditional educational models to address the varying needs of large and diverse student populations is acknowledged. The relevance of traditional teaching and learning models to both generic and discipline specific educational goals is a much-debated topic, as alternatives become available and, as research shows, increasingly viable. Online and computer supported learning in its many forms offers considerable potential for change in this respect. However, the nature of higher education is such that change takes time, is many faceted, and innovation has to advance on many fronts before it can enter mainstream practice. These fronts include external and internal accreditation, policy alignment, administrative support, curriculum design, infrastructure, institutional culture, priorities, individual perceptions and practicality as well as staff and student skills development. A case for institutional adoption of portfolio assessment needs to work from all these different perspectives. There is already some literature that reflects the need for this broad appeal, and certain key players appear to lead the field in this respect. These publications provide the baseline evidence used to develop the case presented in this paper and a proposed framework for wider implementation of portfolio assessment. Particular attention is paid to the changes in program structure and teaching and learning practice that action to address other elements of the framework is designed to support. The focus is therefore on the pedagogical rationale for development and implementation of portfolio based assessment. A range of learning opportunities facilitated by technology such as social software, simulation and multimedia production tools is discussed within the context of portfolio assessment systems for higher education. The temptation to include predictions of future possibilities is avoided, as speculation of this sort has proved consistently unreliable in the past. It is acknowledged, however, that many features of the currently visible learning ‘landscape’ remain largely unexplored, and that the constraints of traditional thinking may obscure the educational potential of tools and assessment strategies that could form an integral part of educational practice in the future. It is easy to be dismissive of things we know little about when they challenge long accepted principles, beliefs and practice. A more suitable approach is to begin with an open mind, design appropriate educational trials, examine the impact from different perspectives and make decisions based on the evidence produced.

Summary
The conceptual shift that is required of higher education teachers and institutions wishing to pursue the trend towards implementation of a portfolio assessment system is only now beginning to be explored in any detail. This attention is no doubt partly driven by recent success in development of a range of robust, interoperable and easy to use e-portfolio software systems. Now the technical and practical barriers are disappearing, the creative and cultural ones come to the fore. While creative subjects such as design, art and architecture have used portfolio assessment for a long time, other disciplines will have to make considerable changes to curriculum design and teaching and assessment practice to implement the concept. In the midst of the wave of enthusiasm about portfolio assessment, it may be useful to step back and ask critical questions about why teachers in other subjects might want to adopt it, whether and how the concept can be usefully applied across the disciplines and beyond to the context of lifelong learning. It may also be useful to examine the underlying systemic issues that making changes to a predominant and long established educational model imply, and whether recent and significant changes to the conditions and context within which universities operate make this a realistic prospect. The purpose of this analysis is to identify the changes that need to occur for successful implementation of portfolio assessment, which is assumed to be desirable, and to identify strategies that have proved effective in driving these changes through institutions and in some cases, through national higher education systems. There is considerable scope for further development of use scenarios and implementation strategies in an area that can best be described as emergent at the present time. There is also good cause for critical treatment of assumptions that any new technology tool can, in fact, achieve the potential its developers describe. In the wake of Y2K, failed online education ‘factories’ and dashed hopes that first generation online learning
management systems would provide everything that tertiary teachers and learners need, the design /
evidence based research approach offers a practical way to proceed with answering these important
questions. The capability of the technology and proof of the portfolio assessment concept are not called
into question. However, in order to be successful, educational innovations have to work within specific
practical and cultural contexts. The evidence-based approach to proof of concept used for this study is
considered essential.

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Theme no.3: Learning and learners (1,2,3)

Laying the foundations: building and extending from the success of the trainee doctors’ e-portfolio. (Work-in-progress; paper and presentations)

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Background

Although many health professions have significant experience using portfolios, this has been largely compartmentalised and not coordinated. The National Health Service (NHS) has no standards for their creation or delivery and to date the use of e-portfolios has been small, isolated and experimental. In August 2005 NHS Education for Scotland (NES) piloted an e-Portfolio for Foundation (trainee) doctors to evaluate the potential benefits for education and the organisation at large. The pilot population included all Foundation Year One trainees from the South East and North East Scottish deaneries, with representative samples from the East and West (n=370).

Objectives

Whilst the immediate measure of the pilot was the evaluation of the e-Portfolio for trainee doctors, the project was also charged with additional and broader objectives. For the Foundation Programme, the pilot compared the efficacy and educational benefits between the paper and electronic formats. The pilot was also being used other professional groups, medical and otherwise, to gauge the advantages of adopting it for other educational activities within the NHS, as well as potential for linkage between undergraduate health education and continuing professional development. Finally, the pilot was to support NES achieving corporate objectives, such as creating educational infrastructure and promoting lifelong/e-learning to ultimately benefit patient care.

Summary of results

From the onset the e-Portfolio has been thoroughly evaluated, both in terms of hardware/software integrity as well as ease and frequency of use. Due to the developing nature of the system during the pilot, user feedback was used to update and improve functionality at regular intervals, rather than waiting for the end of the pilot to make changes. A formal online survey was conducted in late October 2005.

Usage statistics are automatically generated by the system and have shown strong and consistent use from the launch of the pilot. The e-Portfolio is accessed from both NHS and home, at all times of day and night. Qualitative data has been compiled the online survey, email feedback and free-text response from training evaluation.

It was quickly apparent that users of the electronic system enjoyed distinct advantages, including:
Automated collation and analysis of assessment – saving considerable trainee, tutor, educational supervisor and administrative time and resource

An effective messaging system and automated reminders for users

Early flagging of poor performance

A more versatile, transferable and accessible format

The Foundation e-Portfolio demonstrated itself to be a robust and stable system throughout the course of the pilot and has brought considerable savings and benefits to all its users – trainees, tutors, educational supervisors and deanery administration.

Conclusions and recommendations

From its inception the NES e-Portfolio was designed to enable easy expansion at a future date, and following the success of the pilot the system is currently undergoing considerable growth on many fronts.

A number of technological improvements, identified by the pilot, are ongoing. Discussions are underway with undergraduate and CPD educational providers (e.g. universities, Royal Colleges) around the transfer of material to and from the NES system to enable learners’ portfolios to follow them throughout their careers. User applications, such as a CV generator, are being developed to add to the functionality of the e-Portfolio. And all source code is being examined and rigorously tested to improve performance. At time of writing, efforts were underway to incorporate the system within a federated learning environment.

The Foundation pilot’s success lead to the expansion of the project beyond the initial cohort to permanently include all of Foundation (Year One and Two) doctors in all Scottish deaneries – a quadrupling of users for August 2006. The expansion did not remain in Scotland however. The Conference of Postgraduate Medical Deans in the UK (COPMeD) endorsed the product in late spring and the e-Portfolio was modified to deliver for England trainees. At time of writing a number of UK (outside Scotland) deaneries were set to join the system as of August 2006, with many more opting to join when their user data is compatible in the near future.

The NES e-Portfolio has also been adopted for other staff groups. The software currently has been modified and is delivering e-portfolios for general practitioners, pharmacists and trainee dentists, with discussions for further expansions at various stages with nearly every health profession in Scotland. The initial Foundation e-Portfolio was created largely to provide for assessment, but the product has been steadily diversifying to support reflective practice, professional tools and deliver e-learning. The fact that the NES e-Portfolio has so quickly expanded in size and function is testament to the utility and potential of e-Portfolios to the National Health Service.
IMPLEMENTING AN INSTITUTION-FREE MODEL OF EPORTFOLIO PRACTICE ACROSS EDUCATIONAL SECTORS: THE NOTTINGHAM EXPERIENCE

Philip Harley, formerly of City of Nottingham Children’s Services; Angela Smallwood, University of Nottingham Centre for International ePortfolio Development

Introduction: Background to the Nottingham Passportfolio implementation

Passportfolio is a learner-controlled, web-based ePortfolio which became available from September 2006 to all schools and colleges in Nottingham and Nottinghamshire, building on the success of its predecessor system, the City of Nottingham Passport.(1) The Passport has been used by 3,500 learners over a three-year period. The new site will be rolled out to over seventy schools and seven colleges, plus a range of other educational establishments. This represents a significant increase in the scale and breadth of the Nottingham 14-19 project, whilst its maturity offers new opportunities to contribute to the debate on ePortfolio models and approaches to implementation.

Designed to be used with learners in the secondary and tertiary sectors, Passportfolio provides space to record achievements and store work, a structured career-education guidance programme and the ability to make a range of presentations. It sits at the heart of an area-wide transition policy which aims to increase the level of participation in post-16 education and to ease progression for the student moving from one stage of learning to the next, as well as from one institution to another. It includes a common application form for post-16 provision and ‘new entrant’ profiles for both local universities. Its data structure conforms to the draft British Standard BS8788 (UK LeaP). A data-mapping approach to interoperability, allowing learners’ data to be transferred from one institution’s data management system to another’s, has been succeeded by a web-services approach.(2)

The development work has been carried out within a matrix of varying partnerships under the 14-19 umbrella, including one important, and in many ways unique, collaboration with the University of Nottingham. The Passportfolio is not based within any one institution and depends upon the partnership working of all its stakeholders. It is a local solution to local issues and part of its success lies within the sense of ownership experienced by the users. It is central to the policies of local authorities and providers of advice and guidance. Many of these local issues derive from changing national policy and the final section of this paper outlines the latest regional developments of the University-led collaboration in Nottingham and its national implications.

The major objective - Engaging learners

The fundamental philosophy behind the Passportfolio development is the empowerment of learners. While the aim is to engage all stakeholders, the learner will always remain the most important. The belief that ePortfolios automatically enhance learner performance, enjoyment and engagement needs to be tested and, so far, too little work has been done in this field. We have recently begun the process of developing an evaluation framework and have evaluated both the City of Nottingham Passport and Passportfolio in terms of human-computer interaction. More importantly, perhaps, we have looked at how it might enhance some of the potential outcomes, such as the production of a personal statement. Interviews with young people indicate significant support for Passportfolio. It has also received praise and encouragement from teachers, student advisers and data managers. The results presented below are an interim snapshot of part of the findings; they represent only the ‘learner engagement’ area of the evaluation exercise, which is still in process and will be written up in full in due course.(3)
Groups of learners from four city and county schools and colleges with very different profiles were chosen, including both male and female students (all with at least basic IT competence) and a series of age groups between 13 and 19. Learner responses to both the original Nottingham Passport system and the Passportfolio prototype were captured. Students worked through activities selected from the full content set out below, in order to produce a personal statement.

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<th>Content of the Nottingham ePortfolio systems</th>
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<td>Recording work experience</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Recording skills e.g. employability</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td><strong>Achievement Zone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal development programme, including quizzes and interactive games on learning styles, self-discovery, articulation of skills, qualities, aptitudes and values, aspirations and plans; researching into learning pathways; careers guidance and useful links</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td><strong>Reviewing Zone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV template with examples and advice</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Personal statement template, writing frames, examples</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Applications for Further Education/training providers</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>New Entrant Profile for local universities</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td><strong>Presenting Zone</strong> — automatically populated with data entered in the two previous zones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information on using the ePortfolio</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>Bulletin board for sharing good practice</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td><strong>Information Zone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viewing of students’ work; providing feedback</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>Checking draft applications and providing references</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>Monitoring progression</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td><strong>Students’ Progress Zone</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Learner engagement: headline findings**

**Usability and enjoyment**
Responses to new activities introduced as part of Passportfolio

The assumption was made that the additional Passportfolio functionality, introduced through the development of the Reviewing Zone with its interactive games, would create greater learner engagement. Student comments from the evaluation included:

‘I think the new software was better at giving ideas for the personal statement’
‘Second site was better than the first’
‘It was more fun than the old one’

92% of learners thought the activities helped them understand their qualities and aptitudes.
87% stated that they found reading the descriptions of their results interesting.
88% of students found the activities useful in writing about themselves.

Usefulness of an ePortfolio in developing a personal statement

Here is a sample of the range of learners’ comments:

‘It gives me words about myself’
‘Some of the games were too long’
‘It helped me write about myself’
‘Some phrases used words which were hard to understand’
‘I like this because no-one’s ever asked me what I’ve achieved before’
‘I thought the new software was quite good and told you a lot about yourself’
‘Difficult in some parts to understand and it wants to know too much’
‘I have written down things about myself that I usually wouldn’t have thought of’
‘I was able to find out more about myself and realise the kind of person I am’.

A new dimension to learner engagement

Whilst questionnaires provided data and individual perceptions on the student-software interaction, classroom observations of the test activities revealed an interesting level of student-student interaction. Girls in particular did not engage with the ePortfolio as a solitary exercise and on many occasions shared their own personal reflections with friends. Often they found it easier to comment on the attributes and skills of friends than on their own. In some cases students swapped monitors as they asked each other ‘Do you think that’s like me?’ They seemed more willing to interact socially around the ePortfolio activities than would have been the case if they had been using a paper portfolio. Also, while students made it clear that they could see the advantages of using an ePortfolio, they went further by suggesting additional ways in which they could envisage using it. They said that they felt more engaged in the writing of their personal statements because they enjoyed using the interactive quizzes.

This evidence will support the task of engaging stakeholders, by defining some tangible benefits gained from actual classroom experience.
The implementation strategy - Engaging stakeholders

It was immediately obvious, at the start of the implementation process for the Passport in 2002, that, for this project to succeed, all stakeholders beyond the learners themselves would need to be actively engaged and to work together. Schools and colleges, local strategic policy makers, guidance professionals, universities, training agencies - all had to believe that Passport would offer them specific benefits, individually, in addition to the main gain of enhancing the learning of young people. At the same time, they had to contend with a huge weight of national policy directives constraining institutions’ planning. Existing structures and incentives for cross-institutional collaboration needed boosting.

The major key to progress lay in identifying the priorities of each group, through consultative meetings, and in offering solutions to tangible problems. For some the issue might be the disengagement of learners, for others the lack of reliable data or the need to improve the attainment and progression of their students. A major step forward was taken when we gained the policy agreement from partners to adopt a common electronic application process for entry into post-16 education institutions in the region, and to base it on the ePortfolio. This acted as a significant driver from which other benefits could be gained.

All stakeholders felt able to take something away from the process because all were involved in the planning. Guidance professionals helped plan the career element of Passport, whilst colleges designed the application. It was also tested by students and teachers. More than one stakeholder provided money for the project. Those involved became catalysts for change in their own organisations, greatly assisted by the fact that technical and pedagogic solutions were being developed within a political context, ensuring the involvement of both strategic leaders and practitioners.

Another key strategy was to ensure that existing electronic services were not duplicated, thus avoiding alienating partners. Where existing services were in place, links were provided. The collaboration with the University of Nottingham and the conceptual development of a ‘thin ePortfolio’ application, where the user orchestrates a range of distributed web services rather than using a single software package, supported this approach.(4)

Partnership work can be as time-consuming and frustrating as it can be rewarding, but it sits at the core of success if the institution-free ePortfolio model is to be pursued.

National stakeholders – Scaling up the Nottingham experience to wider, regional implementation

JISC-funded developments

The University of Nottingham ePortfolio Centre has been building on the Passport partnership to take forward work on web services for ePortfolio through its JISC-funded project, RIPPLL (Regional Interoperability Project for Progression in Lifelong Learning).(5) The consortium now also includes Nottingham Trent University, the Toyota-Lexus Academy and several post-16 colleges, and has demonstrated the feasibility of transferring the learner’s data between all the ePortfolios in the Nottingham area and an employer’s HR system, joining up a whole Lifelong Learning pathway.

The Passport has been part of the RIPPLL technical development process by which mapping data to interoperability standards (a ‘pass-the-parcel’ model of transferring the data relating to an individual learner) has recently given way to a web services approach. Institutional systems can use the web services we have specified, but the fully learner-centred version of an ePortfolio across all partners would require an institution-free, hosted solution – something like the facility provided for 14-19 by the Passport, but across the full range of types of learners throughout life, for which there is no single source of
authority or responsibility. The challenge of achieving collaboration between all relevant partners and stakeholders on this scale is very considerable.

**HEFCE initiative for Lifelong Learning Networks (LLNs) – piloting a new way forward**

HEFCE, the Higher Education funding council for England, is, however, incentivising universities to take a leading role in some major regional consortia which are being set up to widen participation to higher education, with a special emphasis on vocational pathways and work-based learners. Work currently being planned for a Nottinghamshire and Derbyshire Lifelong Learning Network (LLN) gives ePortfolios a major role. By the time of the conference, we will be able to say much more, more definitely, about the programme of activities 2007-2010. The intention for the ePortfolio strand is essentially to scale-up the RIPPLL project to the whole of Nottinghamshire and Derbyshire, across a consortium including all four universities and all post-16 colleges, supported by regional government bodies, employer organisations, etc. In the first phase of work, existing systems, such as the City of Derby electronic Individual Learning Plans (ILPs), will be made interoperable and, where there are no existing systems, a hosted ePortfolio system will be piloted so that we begin to join up lifelong learning for the region. The implementation of the Careers Wales ePortfolio offers an obvious comparison, but as far as England is concerned, perhaps only LLNs have the combination of vision, will and funding needed to put together a collaboration on the level required to implement the hosted ePortfolio solution which will fully empower individual learners of all kinds.

In a second phase of work, the outcomes of a further JISC-funded project, JOSEPH (7), based in the Nottingham consortium 2006-2009, will also be rolled out to the whole LLN. The focus of this initiative will be two-fold – interoperability between services for information, advice and guidance and learner-owned ePortfolios, and the function of ePortfolios to integrate multiple, simultaneous learning strands (e.g. study and work placement), with special reference to the needs of learners taking new qualifications being introduced in the UK for vocational pathways: Specialised Diplomas. In this example of what we might call ‘lifewide learning’, the individual learner is expected to engage with more than one institution at a time, operate between different providers of learning/training/work simultaneously and interact with a range of mentors in a number of different locations. There could hardly be a clearer case than this for the implementation of learner-owned rather than institution-specific ePortfolios.

The situation in the UK at the moment represents something of a paradoxical half-way house. While ePortfolios for Lifelong Learning are high on national policy agendas, the readiest way to implement them in practice is offered by individual institutions designing their own provision, because this is what the existing structures and the culture of institutional autonomy in the UK are best oriented to do. Many schools and colleges within the 14-19 sector are being directed towards simple, institutional, vendor solutions, a trend which would appear to be counter-productive in terms of achieving ePortfolios for Lifelong (or lifewide) Learning. This perhaps is where the potential of the Nottinghamshire/Derbyshire LLN partnership is particularly exciting – it may allow us to achieve something similar to the Nottingham collaboration at a regional level across two counties. The really interesting results, however, will lie with the research into the attendant learning processes. It will be crucial to gain insights into the sorts of developmental process by which both whole institutions and individual learners migrate most successfully from the educational culture based on an institutionally-provided model of ePortfolio to the new learning environments which will be inspired by the kinds of ePortfolio which are genuinely learner-centred and institution-free.

**References**

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http://www/elframework.org/refmodels/epl/UKLeaP%20summary%20and%20guidelines1a.doc

3. An interim overview of all the Nottingham-based ePortfolio work will be published shortly as:
   ELIZABETH HARTNELL-YOUNG, ANGELA SMALLWOOD, SANDRA KINGSTON, PHILIP HARLEY (2006),
   **JOINING UP THE EPISODES OF LIFELONG LEARNING: A REGIONAL TRANSITION PROJECT**, 
   BRITISH JOURNAL OF EDUCATIONAL TECHNOLOGY, VOL 37 NO 6.

4. For information on important recent JISC-funded work on proposals for a technically ‘thin’ ePortfolio
   for lifelong and life-wide learning, located within a service-oriented architecture, see the website of the
   University of Nottingham Centre for International ePortfolio Development:
   http://www.nottingham.ac.uk/eportfolio/ for reports from the ePortfolio Reference Model project,
   especially PETER REES JONES (2006), **A THIN E-PORTFOLIO MODEL, JISC E-PORTFOLIO REFERENCE
   MODEL APRIL 2006 REPORT, #8,**
   http://www.nottingham.ac.uk/epreferencesmodel/keydocuments/eP%20RM%20final.doc#_Toc134269028

5. http://www.nottingham.ac.uk/rippll/


7. ‘JOSEPH’ stands for ‘Joining up Organisations to Support new Engineering Pathways into Higher
   education’ – see http://www.nottingham.ac.uk/eportfolio/joseph/

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BOTTOM UP MEETS TOP DOWN: EPORTFOLIOS IN VICTORIA, AUSTRALIA

Elizabeth Hartnell-Young, The University of Nottingham. Janette Ellis, GeneratED.

Introduction

The history of ePortfolio development in Australia is characterised by small-scale local projects, mainly in schools and universities, over the past decade. Many of these initiatives are of the type that we call ‘bottom up’. Bottom up projects are sometimes described as emerging from the needs identified by users, usually individual teachers or small groups in a single institution, based on local evidence. The expressed purpose of these projects is often learner-centred, emphasising a social context. On the other hand, in this paper ‘top down’ refers to policy made and practice implemented generally at a large scale, such as statewide or national approaches to ePortfolio development. While ‘top down’ projects are also informed by evidence, they usually draw from the experience of other projects of similar scale. The purposes include addressing the needs of employers, administrators and governments, leading to mandatory requirements for the structure or the practice of ePortfolio development. This paper reports on two standards-oriented ePortfolio projects currently under way in Victorian state schools. The first is a project for beginning teachers, while the second focuses on students’ learning. We acknowledge that there are potential tensions between the two perspectives, and in this paper we explore how each might contribute to building individual and collective knowledge.

In Australia there have been no government policy announcements promoting universal ePortfolios, either nationally or in any of the states and territories. However there have been some relatively large implementation projects, notably in universities. In the state of Victoria, both the school sector and the Technical and Further Education (TAFE) sector of the Department of Education and Training have recently taken steps to provide support to individuals and institutions wishing to work with digital and ePortfolios. The transition of learners between sectors of their lifelong learning journeys is one area that can be supported by ePortfolios containing evidence of, and reflection on, education, skills, and work experience, among other information [1]. Recognising this, at the national level, the Department of Education, Science and Training (DEST) in Australia has recently explored ePortfolios as a tool to support its strategic focus on improving transitions between school, further education, training and employment [2].

While the broad purpose of ePortfolio development in schools is generally to support improved teacher and student learning, the effects of the accountability culture influenced by international testing and evidence-based philosophies are being felt in Australia. One manifestation of this is the development and documentation of performance standards for both students and teachers, and the accompanying collection of data. As Barrett [3] argues, schools need to provide evidence that they are doing their job—educating students—however, qualitative evidence can also be sourced from the rich portfolios of individual students and teachers.

Using ePortfolios as evidence of meeting standards implies assessment. Some early school-based portfolio development projects in Victoria grew out of a desire for richer and more authentic forms of assessment of students’ learning. Both formative evaluation (which takes place in a continuous process during the development of a portfolio) and summative evaluation (the judgement following completion of a portfolio) took place. The evidence contained in the portfolios was generally only for the students’, teachers’ and parents’ eyes, rather than any external audiences. The Victorian Curriculum and Assessment Authority (VCAA), which is responsible for curriculum and assessment programs for all students in Victoria, reflects the bottom up view in its material supporting portfolios for assessment. Rather than imposing requirements for ePortfolios, it states:
Teachers and students work collaboratively to ensure that appropriate choices of materials are made that provide evidence of a student’s performance in terms of purpose and audience. Portfolios are most effective when they are embedded into a triangulated interview where they provide a discussion point for teachers, parents and students. Wherever possible students should be given the opportunity to present or speak to their portfolios, outlining the learning they achieved and the strategies which helped them achieve their goals [4].

The emerging context of ‘productive assessment’ in Australia [5] builds on ‘productive pedagogies’ and encourages dialogue between teachers to make meaning and establish a shared understanding of the type of student performances they are working towards. Hayes et al suggest that ‘productive’ is a more useful term than ‘authentic’ as it does not imply a single ‘true’ form of performance or assessment. The four dimensions of productive assessment are intellectual quality, connectedness, supportive classroom environment, and working with and valuing difference. In this paper we consider these dimensions in our attempt to describe the relationship between individual and group portfolios created for learning and the mandated accountability frameworks.

Portfolios can be both containers of assessment products, and more richly, reflections of productive processes. Making judgments about ePortfolios is a problematic issue, but one that must be addressed by both users and audiences. Carney [6] rightly raises questions about whether portfolios can be reliably assessed, and if so, whether they then enable valid interpretations about achievement. Further, she suggests, even if this is possible, using portfolios in high-stakes decisions might destroy their usefulness as a learning tool. Baume and Yorke [7] suggest that portfolios have two valuable components for the assessment of professional abilities. First, as they hold authentic evidence of the work of a professional, they have the potential to be highly valid, offering primary evidence of outcomes achieved rather than secondary evidence such as the ability to talk about how outcomes could be achieved. Secondly, where they include critical commentary, in which the creators reflect on the evidence presented and make a claim that this evidence shows how they have attained intended outcomes, underpinned by required professional values [7].

Like the Department of Education, Science and Training, some state departments and schools have recognised that technology could also support better management of information about students and their learning. Technology systems enable material generated by students and teachers in their ePortfolios to contribute to knowledge building on a larger scale than was previously possible. However, such long term, large scale storage of rich digital archives makes the choice of hardware and software and its specifications very important. The growing range of virtual learning environments and ePortfolio products means that these decisions should be informed by the goals and experience of both those ‘at the bottom’ and ‘on the top’. In the next section we refer to actual examples to explore this suggestion.

**Victorian Projects**

Since 2002, beginning teachers have been required to develop a portfolio (digital or hard copy) of evidence that they meet the standards of professional practice to enable full registration with the Victorian Institute of Teaching (VIT). The development of a portfolio is intended to enable beginning teachers to engage in professional dialogue and reflection with mentors and peers around a shared understanding of professional standards and practice. Currently a number of schools are supporting first-year teachers to develop digital portfolios in response to the VIT requirement. The second project is a pilot programme among clusters of schools in education regions across the state, designed to evaluate the development of students’ digital portfolios that capture evidence of the Victorian Essential Learning Standards (VELS) and improve the quality of reporting to parents. One of the authors has been closely involved in both projects.

**Addressing the Standards of Professional Practice**

The Victorian Standards of Professional Practice for Full Registration [8] consist of eight standards under the broad headings of Professional Knowledge, Professional Practice and Professional Engagement. The Recommendation Report for full registration must detail evidence of professional practice demonstrated through a portfolio containing records of three collegiate classroom activities, an analysis of teaching and learning, and a commentary on professional activities. Guidelines are
available to all provisionally registered teachers, their mentors and schools in Victoria. We sought to explore the possibility of using the standards as a basis for rich ePortfolios that might be a vehicle for increasing the awareness of both the beginning teachers and their audiences of the complexity of teaching, encouraging dialogue around teaching practice and contributing to building knowledge.

From VIT’s point of view, the focus of the beginning teachers’ project was to ascertain to what extent the use of digital technologies could make their work come alive in a way that a traditional hard copy portfolio could not. For the producers, the high stakes purpose was to demonstrate meeting the eight standards in each of the three required focus areas listed in Table 1, by using text, graphics, video and audio artefacts. With an experienced teacher acting as a coach, and their school mentors, a small group of teachers in one school became familiar enough with the standards over several weeks to create and select best practice examples to include in their digital portfolios. They used a homegrown software initially designed for students to create digital portfolios, and developed by the ICT technician at the school.

**Table 1: Standards of Professional Practice, Victorian Institute of Teaching**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Focus Areas</th>
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</thead>
<tbody>
<tr>
<td>1. Teachers know how students learn and how to teach them effectively</td>
<td>Collegiate classroom activities</td>
</tr>
<tr>
<td>2. Teachers know the content they teach</td>
<td>Analysis of teaching and learning</td>
</tr>
<tr>
<td>3. Teachers know their students</td>
<td></td>
</tr>
<tr>
<td>4. Teachers plan and assess for effective learning</td>
<td></td>
</tr>
<tr>
<td>5. Teachers create and maintain safe and challenging learning environments</td>
<td></td>
</tr>
<tr>
<td>6. Teachers use a range of teaching practices and resources to engage students in effective learning</td>
<td></td>
</tr>
<tr>
<td>7. Teachers reflect on, evaluate and improve their professional knowledge and practice</td>
<td></td>
</tr>
<tr>
<td>8. Teachers are active members of their profession</td>
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</tr>
</tbody>
</table>

Teachers used video clips to introduce the classroom context to the viewer, as evidence for creating and maintaining ‘safe and challenging learning environments’ and to show that the learning environment was a demonstration of the school’s values and beliefs. Using Quicktime Virtual Reality Technology (QVRT) the teachers recorded 360 degree panoramas of the classrooms to show aspects of the learning environment such as the colour and texture, positioning of tables, stimulus corners and learning centres and resources in the classroom. It was felt that this visual demonstration conveyed the atmosphere of a classroom more powerfully than a text description. In addition, a slideshow with music clips as used in the classroom captured one teacher’s personality and practice, while written reflection indicated how the evidence selected linked to the school’s espoused values and beliefs.

For the analysis of teaching and learning, the teachers were required to focus on two students from their classes for a detailed analysis of their learning needs and how they were catered for. A learner profile and background statement and reflections were included with samples of student work. Each teacher interviewed two students about their learning, their attitudes and their achievements.

The experienced coach assisted the teachers to consider a variety of ways to represent their work and to make connections where, for example, one piece of evidence could serve multiple purposes. In the professional development section she encouraged the teachers to make a commentary on how they implemented their learning in the classroom. For example, a report on a mind mapping activity they had participated in was accompanied by images of students’ mind maps developed in class.

The resulting portfolios were presented by the individual teachers to an in-school assessment panel, consisting of the principal, the teacher’s mentor and the professional development or curriculum coordinator in the school, with the purpose of review and recommendation for full registration. This
provided an authentic audience for the portfolio as well as an opportunity for feedback and reflection on both the process and the end product. As part of the project, the authors were able to collect first impressions from the teachers and the panel. In a group meeting reflecting on the process, teachers made comments such as ‘It made me think about students and how I am catering for them in the classroom’. Using technology as a matter of course to capture rich evidence of the learning environment and student activities and reflections is an element of ePortfolio development that is still quite new, but these teachers were encouraged to think about capturing such evidence from an early stage. One commented: ‘The digital portfolio allowed me to say more about myself as a teacher, especially the QVRT’.

The teachers found the local software was somewhat limiting because the linking and the navigation was not smooth enough for their needs, and it has since been modified. However they appreciated the collaborative model, as they could ‘bounce ideas off each other’, while the finished product was said to be ‘interactive, bright and personal’. Importantly, one teacher recognised that the portfolio development process she had undertaken would benefit her teaching and could by used with students:

*The collegiate classroom activities were very positive and the documentation and reflection on professional development made you think about the benefits and how to integrate this learning into our classroom programs.*

The presentation format was an innovation for the school, the beginning teachers and the assessment panel. One teacher said ‘The digital portfolio added a different dimension to the presentation to the assessment panel and supported you visually when trying to articulate what you do in your classroom’. General comments from the panel agreed that the form of the portfolio: ‘enabled clear evidence to be demonstrated’ and ‘it made the presentation to the assessment panel more interactive and stimulated a great professional dialogue between teachers on their professional practice’.

In terms of the content, a panel member commented ‘You saw the evidence, you didn’t have to wonder if it was real, you could see transparently what the teacher was doing and what the students were doing. There was evidence of the teacher evaluating what the kids were doing’. The panel was similarly interested in the process of developing an ePortfolio, while a principal acknowledged ‘I could see how hard I make my teachers work. I thought about the needs of young teachers coming to a new school: the need for induction and mentoring’. The process also gave more experienced teachers ‘a sense of the standards: what they look like, what they feel like for a high quality teaching professional’. One teacher reflected that the digital portfolio process was more purposeful ‘because it was not just for VIT but to build professional development and learning around it’. This project was a high stakes activity for the teachers, and they engaged with it positively, stating that they enjoyed working together on planning and the reflection, and debriefing together.

While teachers made maximum use of the technology, it required more time (including several weekend sessions) for the teachers to develop the portfolio product than when using paper-based formats. However as the portfolios follow a ‘top down’ structure, they provide a basis for further development in the profession, and perhaps, an understanding of how learning standards can be used with students.

*Assessment of Victorian Essential Learning Standards*

Recently the Victorian Essential Learning Standards (VELS) were introduced into Victorian schools for students from Preparatory to Year 10, and these formed the basis of the second project, focusing on portfolios for students. They provide a whole-school curriculum planning framework that sets out learning standards for schools to use to plan their teaching and learning programs, including assessment and reporting of student achievement and progress.

Aware of the increasing interest in portfolio development in its schools and internationally, the Victorian Department of Education and Training initiated its Digital Portfolio Project in 2006, allocating a small amount of funds across nine regions to trial a range of formats and processes. For the Department, the purposes were to inform assessment of student achievement in relation to VELS and to improve the quality of reporting to parents. In its call for participation, the Department stated:

*To be most effective, the portfolio should include student participation in selecting content, the criteria for selection, the criteria for judging merit and evidence of student self-reflection and goal setting.*
The intended outputs included resources and exemplary materials for other teachers to use in future years. In this project, the local purposes and formats were determined by the participating teachers, so that different regional clusters focused on areas such as authentic assessment; three-way conferencing between parents, teachers and students within a pastoral care model; goal setting and reflection with students; and transition.

One of the regional projects is being conducted by a cluster of four primary and secondary schools with facilitation by the authors. This small group of experienced teachers chose to focus on a small part of VELS, the Interdisciplinary Strand, and its four domains of communication, design, information and communications technology (ICT) and thinking, as outlined in Table 2 below.

**Table 2: Victorian Essential Learning Standards for Interdisciplinary Learning**

<table>
<thead>
<tr>
<th>Interdisciplinary Learning</th>
<th>Communication</th>
<th>Listening, viewing and responding Presenting</th>
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<tbody>
<tr>
<td></td>
<td>Design, Creativity and Technology</td>
<td>Investigating and designing</td>
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<td></td>
<td></td>
<td>Producing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analysing and evaluating</td>
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<tr>
<td></td>
<td>Information and Communications Technology (ICT)</td>
<td>ICT for visualising thinking</td>
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<td></td>
<td></td>
<td>ICT for creating</td>
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<tr>
<td></td>
<td>Thinking Processes</td>
<td>ICT for communicating</td>
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<tr>
<td></td>
<td></td>
<td>Reasoning, processing and inquiry</td>
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<tr>
<td></td>
<td></td>
<td>Creativity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reflection, evaluation and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>metacognition</td>
</tr>
</tbody>
</table>

The teachers chose a commercial software product designed specifically for school students to use in developing their portfolios. Teachers began by creating their own ePortfolios in order to familiarise themselves with the software, and to make judgements about its suitability for their students. All teachers decided to use this software with the students as it is simple to use, automatically storing all chosen items in a media folder, and enabling output to server, CD-ROM or DVD. However unlike portfolios created using html authoring tools, the audience requires the particular software to read a portfolio created within it.

Some of the teachers had previous experience with paper-based portfolios. A Year 5 & 6 teacher described the way students used portfolios prior to joining the project:

*Children use the portfolios for reflection, to monitor their own progress, set future and current goals and determine what work they need to be involved in. They use the portfolios in the 3-way conferences mid-year. Over the four years the portfolios have changed quite considerably in line with what the children have found useful. They have had more of a say in their content each year.*

This reflects the type of relationship that the teacher is endeavouring to create with her students, and with parents. Regular feedback and monitoring, and the opportunity to negotiate goals and curriculum, all take place within a mandated curriculum framework, but individual and local input is not stifled.

For this project, the Year 5 & 6 teacher chose to use digital portfolios to demonstrate evidence for the Communication domain of VELS, and in particular to support the genre of ‘procedural text’. Using a range of technologies, the students collected digital photos, scanned hard copies, recorded sound clips and videos and in each case, included explanations and reflections that were saved in a portfolio folder on the school’s server. At the same time, they worked in groups to develop either a flow chart or procedural text on the actual techniques of saving and importing digital photos, or recording on the mini disc. Hence the portfolio process was fully integrated into the curriculum.

Another teacher of Year 3 & 4 focused on narrative forms by using the portfolio development process to create and analyse text; edit and revise; interpret and reflect on writing narratives; to critically
analyse to improve what was written; and look at an array of strategies to identify and establish character, plot and settings. She noted:

I allowed the students to branch off and make it a record of what they considered important in their individual learning. I found this to be extremely beneficial for the students. They were able to identify how they learnt, and to take ownership for their learning.

In the secondary science class, comprised entirely of boys, the teacher chose a general theme for the portfolio project: ‘Global Citizen, Universal Citizen? Or both?’ She decided on the focus areas after discussion and coaching with the facilitators. She stated that she wanted to develop personal and social learning, and student voice, and encouraged students to include information captured using familiar technologies such as mobile phones.

Each of these teachers referred to their past experience and their subject knowledge in planning portfolio structures for their students, rather than consulting the VELS documents closely. They decided to ask students to use portfolios to report on a small part of the curriculum rather than the whole experience. This project is still at an early stage, so we are yet to collect data on the goal of improving reporting to parents, and on teachers’ and students’ judgement of the project.

Discussion and Conclusions

To guide our reflections we considered themes that arose from the projects described here, and constructed Figure 1 to show these themes in relation to top down and bottom up approaches. We suggest the ‘bottom’ contributes personalised ePortfolios that often reflect the personality of the creator in a relatively free approach, as exemplified in the student narrative portfolios and teachers’ video artefacts. The processes of learning were very important in all these projects, more so than the outcomes, and they were recorded and reflected upon. Such ePortfolios can legitimately present work in progress, rather than only best examples.

We found that our participant teachers tended to use language from the domain they were working in, practitioner or local terms. They engaged in dialogue around ePortfolio development, but without the support of the Department, the extent of sharing across classes and schools would have been limited, we suggest. While this is important in terms of developing local identity, for broader conversations at national or global scale, and to influence educational policy, we suggest it is essential to understand and use the language of those one wishes to influence [9]. At present, the bottom up, individualised approach tends to benefit individuals rather than the wider educational community. Discussions with teachers indicated that they interpreted the VELS standards for their students, without sharing the documents with them, in spite of speaking about the important of student voice. In terms of software, the bottom up projects that develop local software can meet local needs, but in the case of the beginning teachers the software was considered a limitation on the teachers’ portfolio development.

From the top, we saw an encouragement for a collective culture, whereby the Department of Education and Training requires schools to share their knowledge. A conception of lifelong learning that seeks evidence of measurable learning outcomes, rather than a focus on learning processes, leads to the incorporation of best examples at particular points in time. The language tends to be generic, adult and prescriptive, as would be expected from frameworks of accountability, but the structure provides a scaffold for reflecting on and recording learning that is sometimes missing from purely bottom up projects. While we have not discussed them here, purposes of knowledge management and technical standards for interoperability, security and privacy tend to be emphasised more by the top than the bottom.
* Collective culture   * Language and frameworks of accountability   * Measurable learning outcomes   * Technical Standards

**Intellectual quality**

**Connectedness**

**BUILDING KNOWLEDGE**

**Supportive environment**

**Working with and valuing difference**

* Personal   * Lifelong learning processes   * Individual voice   * Local language   * Local software

**Figure 1: Bottom up meets Top down: the creative space for building knowledge**

Senge [10] uses the term ‘creative tension’ to describe the gap between the vision and the reality. In this instance we suggest that a creative tension exists between the top, where policy is made and practice supported, and the bottom, where the current reality consists of numerous local projects. In Figure 1 we display the gap as a site for knowledge building, whereby the four dimensions of productive assessment [5] are contributed in a partnership of the bottom and the top. Intellectual quality is supported by clear standards, and a large-scale system can facilitate connectedness through providing time for sharing and tools for publication of emerging knowledge. Another form of connectedness is made possible by integrated frameworks as in VELS, where students own the development and make the links, connections and associations across their learning by selecting and reflecting on portfolio content. The bottom provides a supportive learning environment, and being itself diverse, contributes expertise in working with and valuing difference that can be shared widely.

In this paper we reflected on two small projects to identify how teachers and students viewed individual portfolio development in the context of ‘top down’ statewide standards documents. We considered how portfolio development that is generally emerging from the ‘bottom up’ can contribute to sharing knowledge within schools and wider education communities. The beginning teachers tested an approach to capturing evidence that we believe has potential benefits for all teachers, particularly in conjunction with the use of recording technologies. The ability to see others at work is relatively limited in schools, due to their design and organisation. Hence the possibility of sharing practice with other teachers in this way is potentially a powerful form of professional development for teachers at all stages of their careers. If this is seen to be important, we believe that time and resources must be allocated to reflection on professional practice, including coaching, so that teachers build professional knowledge in order to help students learn and create knowledge themselves. As yet, standards for teachers and students assume an individualised approach to portfolio production, but future developments should consider creating collective ePortfolios in a collaborative manner [11].
References


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Returning to work, working to return: using ePortfolios to increase women’s employability in gender segregated occupations

Clem Herman and Gill Kirkup – The Open University, UK

Introduction

E-Portfolio development has been implemented primarily in educational institutions and for students: mainly school and undergraduate students. There has been much less discussion and almost no implementation of ePortfolios to support those who have graduated and are in employment; such as mid-career workers engaged in personal/professional development; or for those in transition between these two points: non-traditional students such as part-time adults, the unemployed and those retraining in mid-life. And yet, reports such as that on reviewing ePortfolio products produced by the UK Centre for Recording Achievement argue that ePortfolios have a particular role to play in supporting learners in transition:

‘particularly across transitions between stages of education and employment, which with changing employment patterns and Widening Participation, are likely to vary increasingly in sequence and combination’ (Richardson and Ward, 2005 p7).

What kinds of ePortfolios are most suited to people in these groups? Is there a difference, even a contradiction, between the needs of different groups, or of the same person at different points in their lives? An ePortfolio that a student abandons at the end of a period of study is of limited value for the individual student, even if it provides excellent pedagogic or course management support. What are the criteria for the long term use of an ePortfolio outside an institution when it has been grounded in an institutional framework, a pedagogic rational, and a technical infrastructure? A really successful ePortfolio should be portable, and serviceable throughout a working life, it should have ‘stickiness’ (Jafari, 2004) for the end user. But this stickiness should not be due to its fundamental embeddedness in a particular institutional context - it also needs to have ‘legs’ i.e. be able to travel with the end user into the world of employment (or unemployment).

This paper addresses some of these issues through an evaluative case study of the innovative use of an ePortfolio tool developed at the Open University UK. The ePortfolio discussed here forms part of a short course supporting highly qualified women to re-enter work in science, engineering and technology sectors after a career break. Results from the evaluation described here indicate that integrating the creation by a student of their own individual ePortfolio through the curriculum and assessment activities of a short (100 hours) online course, has proved highly successful; and that for mature students a supported environment in which to reflect and then build an ePortfolio can be a life changing experience that can enhance employability. Further, a stand-alone product (as opposed to one hosted on an institutional website) which can be kept by the user on their own hard drive after leaving the institution is particularly useful for those who are undertaking short programmes of study. Several of the students are now in employment or further training and the majority (77%) plan to continue using their ePortfolio in their professional and personal development planning.

Background: Women Returners

In 2002 the Maximising Returns report produced by the UK government highlighted the problems faced by graduate women returning to employment in science, engineering and
technology (SET) after a career break (People, Science and Policy Ltd 2002)\(^1\). The research showed that women returners face a particular set of problems and difficulties and that these are more pronounced for those trying to get back into the SET sectors. As well as personal issues such as lack of confidence and out of date skills, structural factors (for example long working hours and geographical location) and cultural norms within these industries can make it more difficult for women, especially those with dependent children, to find suitable work. Indeed many women returners are under-employed, i.e. they tend to find work in lower grade jobs than they are qualified for and therefore under utilise their skills and qualifications as well as receiving lower wages - this is particularly true for those in the SET sectors (Tomlinson 2005, Prosser 2006).

In response to the these findings, a national strategy was developed, with funding from the UK Dept of Trade and Industry (DTI) and the European Social Fund ‘Equal’ Programme, to address the issues highlighted. A new UK Resource Centre for Women in SET was established in 2004 and a national campaign to support returners launched\(^2\). One of the key parts of the strategy was the creation of an online course by the Open University (UK) aimed at supporting and empowering women who were returning to employment in SET after a break. The OU was chosen as the best institution to provide a national UK wide course through its supported online and distance learning methodology. The course has been accompanied by a range of other support activities such as a mentoring scheme, work placements, plus individual advice and guidance, provided by a network of regional organisations across the UK.

The target group for the course (women returning to SET professions after a career break) were well defined and known to have particular needs as well as particular skills. Although they were all women with a professional qualification, at least to degree level or equivalent, many were out of touch with paid work and with employment opportunities in particular sectors where they might return. Many lacked confidence in their employment skills; something reported consistently in the literature on women who have taken career breaks (Tomlinson 2005, Shaw 1999). There was a need to help the women recognise and value their transferable skills acquired both in paid and voluntary work, as well as identify where they needed to update skills. The course was designed as a short online personal/professional development\(^3\) (PDP) course tailored to the needs of this particular group of graduates.

**Course description: Science, Engineering and Technology: A Course for Women Returners**\(^3\)

The course which was launched in October 2005 is entitled ‘Science, Engineering and Technology: A Course for Women Returners’ (course code T160) and over 200 women have completed it at the time of writing. Throughout the 10 week period over which each course presentation runs, participants study web-based course materials and engage in a series of online activities and discussions which are designed to take them through a process of personal/professional development planning (PDP).

A major aim of the course was to help women to identify, assess and demonstrate these kinds of competencies achieved through activities outside as well as inside work, culminating the production of a CV and an action plan for a return to professional employment. This process was built on a well developed careers advice model, including 4 basic stages – “know yourself, explore opportunities, decide where you want to go, take steps to get there” (OU Careers Service 2006).

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\(^1\) Women returners have been defined as those who have been out of the workforce caring for children or other dependants and now wish to return to paid work (Tomlinson 2005)

\(^2\) See www.setwomenresource.org.uk for more details

\(^3\) We use the phrase ‘personal/professional’ development, because coming from a tradition of women’s education; we believe that an individual’s development must balance these aspects.
In terms of learning outcomes the course aimed to enable students to

- analyse and evaluate their life experiences and understand how these had affected their career development,
- analyse career opportunities and trends within a SET industry, being aware of organisations, policies and key sector issues
- analyse and value transferable skills
- build on positive experiences and develop strategies for dealing with perceived barriers
- understand their own strengths and weaknesses in relation to lifelong learning
- develop employment-related skills such as interview techniques, recruitment tests, presentation skills and CV writing
- understand the development of key work-related skills – strategic thinking, time management, assertiveness, prioritisation, negotiation, building rapport with colleagues

**Why use an e-Portfolio?**

While there have been many initiatives aimed at supporting women returners (Shaw, 1999), these have generally been face to face or built around printed materials. T160 is the only course that we are aware of that is completely online and therefore available to even the most geographically isolated women. The course delivers to eligible women anywhere in England, Scotland and Wales. Traditionally, ‘return to work’ courses, and adult education courses, help participants build portfolios. But these are usually hard copy collections (Brown 2002, Baume 2003). T160 adopted an e-Portfolio because of the e-learning approach used - it is a web-based course. All course content is on the web, all student interactions with tutors, the institution, and each other take place on the web. All assessment is dealt with electronically. Without the possibility of an ePortfolio, all the activities described above would have still have taken place – online- but without the possibility of an ePortfolio providing the scaffolding make them into a more coherent artifice. Ideally any ePortfolio should match the description given by Educause:

> ‘An ePortfolio is a digitized collection of artifacts including demonstrations, resources, and accomplishments that represent an individual, group or institution....An ePortfolio is more than a simple collection – it can also serve as an administrative tool to manage and organize work created with different applications and to control who sees the work. E-portfolios encourage personal reflection and often involve the exchange of ideas and feedback.’
> Lorenzo and Ittelson, 2005, p1.

In 2005 the OU had already developed a prototype ePortfolio software package (Profile) that was available for us to use. However, because the University is in the process of changing its virtual learning environment (VLE), development work on Profile was suspended. We adopted it knowing that it had limitations in its functionality. But the fact that it incurred no cost to the course developers or students, that it was simple to install and use, and that students could download and keep it to use after the course finished, made it very attractive, Baume (2003) suggests that all portfolios can be categorized into five groups by their use. These are:

- A portfolio as a process tool. The portfolio is used to encourage the user to reflect on their learning and allows them to share that reflection with others – peers or teachers.
- A portfolio as a completion tool. The portfolio allows the user to demonstrate that objectives have been achieved, and usually involves some kind of assessment.
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- A portfolio as an accreditation of prior experiential learning (APEL) tool. The portfolio allows the user to assemble evidence to use to make a claim for prior learning or experience. This usually also involves some kind of assessment for the accreditation.
- A portfolio as a career advancement tool. The portfolio is used to substantiate a job application, or help in the production of a CV.
- A portfolio as a continued personal/professional development (CPD) tool. The user collects evidence in the portfolio to demonstrate continued professional development, to monitor their own skills development or to share with others as evidence for career progression.

T160 uses aspects of four of these. The course authors were originally attracted to the ePortfolio tool for its career advancement role. The main objective of the course funders and well as the students was to get highly trained women practising their professions again. A portfolio device that would help them produce an impressive CV based on an organised collection of evidence of skills and qualifications was the bottom line requirement. During their studies students review their transferable skills, they map what they have learned during their time away from their professions onto their professional skills, and they review what skills and knowledge they need to refresh or update. These are the CPD activities, and APEL activities an ePortfolio could support. However the course itself offers no accreditation of prior experience as such.

It was clear that the reflection and personal development activities that were a major part of the course could be integrated into ePortfolio use. Probably the only function that the ePortfolio on this course was not used for was as a completion tool. This portfolio was not used as an assessment portfolio. Overall our vision was closer to Barratt’s (2004, 2006) idea of a ‘learning portfolio’.

Jafari (2004) argues that not all students or staff are convinced of the usefulness of ePortfolios. If they are not perceived as useful they are unlikely to be adopted by users i.e. they will not be ‘sticky’ enough. If ePortfolios become embedded into the assessment systems of institutions then they have local stickiness but no guarantee that students will continue using them once they have finished formal education. In our context we offered an ePortfolio as a tool for use outside of formal education. It needed to be simple enough to learn to use in a few hours and demonstrate enough ‘future use’ to convince potential users that it would be worth investment of time and effort. Jafari has seven criteria for ‘stickiness’. These are:

- Ease of use
- Sustainable business plan
- Advanced features
- Robust integrated technology architecture
- Lifelong support
- Standards and transportability
- And X – other important unknown attributes

The ePortfolio used in T160 had few of these attributes, probably only ease of use, but, we will argue the X factors (context and user needs) seem to have been strong enough to create stickiness without the other attributes being present.
PDP (Personal/Professional Development Planning)

The process of engaging in PDP has been identified by both higher education institutions (see the Higher Education Academy resources on PDP: HEA 2006) and employers (Edwards, 2005) as crucial in encouraging learning and in providing a structure for the information needed by employers for recruitment and selection. Based on his research with employers in the UK Edwards argues that:

‘Most employers put strongest emphasis on the process of PDP rather than the documented outcomes. In other words, the process is key because it adds value - by helping students reflect on their experiences and improve their ability to articulate and demonstrate resulting competencies during recruitment activities’ Edwards 2005 p 3.

A major part of the PDP process is the critical reflection that takes place. Since Schön’s work in the 1980s, critical reflection has been positioned as key to the process of developing professional expertise. It is increasingly incorporated into the curriculum of higher education. Baume (2003) discusses three types of critical reflection that educators want to encourage in students and that professionals should be engaging in: reflection on action and reflection in action (Schön 1982) and reflection for action (Cowan. 1998). The course participants were neither students doing a professional practice course (novices), nor employed practitioners (experts) at the time they studied T160. Therefore, the reflection that they did was the first and last of these: reflection on what has gone before, and reflection in order to plan ahead.

Edwards’ research also found that employers ‘allow (and demand) reflection and description of both academic and non-academic activities. Overall, the results [of Edward’s research] give a clear pointer to where candidates should generally focus their initial PDP and reflections as a basis for filling out application forms. Edwards 2005, p 3.

The strengths and weakness of Profile

For the purposes of T160 Profile had three main advantages:

1. It is easy to produce texts for CV and development plans that can be imported and styled in any word-processing application. In Profile it is easy to use contents of the ePortfolio to produce a CV, tailored to different requirements.

2. It is free to Open University students. Short courses can be relatively very expensive to produce and run, and for students such as these who are not in employment fees are a significant barrier to access. Use of an expensive ePortfolio could make a course non-viable

3. It is downloaded onto the user’s hard-drive and therefore requires no continued technical support. It is owned by the end-user and available to her as a personal tool long after she has completed the course, and long after she has stopped being a student of the OU.

We note that most e-Portfolios used by institutions at present and discussed at conferences such as this, offer online access with data storage on the servers of large institutions (commercial and educational). This is problematic. Luca et al (2003) report that in their own institution the uploading of ‘unknown’ and ‘un-managed’ student resources created technical, legal and security issues, that resulted in students having to store all their resources offline – separately from the institution’s e-Portfolio. When an ePortfolio is hosted on the server of an educational institution, that institution must continue to provide support for graduates, for some years at least. This requirement has caused some institutions to use commercial
providers (such as ‘ePortaro’), and when students graduate they must continue to pay the licence fee to keep their ePortfolio live.

In an application like Profile, where the ePortfolio and all its contents sit on the student’s own PC, the student selects and presents what she wishes anyone to see, and makes links to University sites and to files on her own PC as appropriate. There are no issues of access rights or privacy. Access is controlled by the student. The course operates on the very simple principle that ePortfolios exist primarily for the end-user. To be useful a portfolio has to be owned, in this case owned by an individual who would find it useful in their professional lives. Students were introduced to Profile on the course and it was emphasised that it could be used as a personal organisational tool from that time on. There was no expectation that tutors, employers or others would look at the contents of the ePortfolio as such. Others would only ever see documents produced by the ePortfolio owner: CVs, action plans, training records, learning logs.

The course activities are therefore structured around the creation of an ePortfolio, which grows as the student progresses through the course. These activities include both individual and group work, some of which form part of the mid-course and final assessments that are required in order to gain course credit. Profile performs a central role in the course, enabling the collation of prior work and educational experience, linking to documents stored on the student hard-drive, reflections on achievements and disappointments, records of strategies for returning to work and finally an output that can be turned without much additional work into a standard CV.

One of the objectives of the course is to encourage students to adopt a reflective approach to their learning and incorporate this into personal development planning. Since many of the students graduated in a SET subject over ten years previously, they would have had little engagement with the kind of reflective learning journals that are more common in education today. And none would have had experience of the kind of initiatives now being developed to use ePortfolios in undergraduate engineering education (Knott et al 2004). The reflective activities students engaged in on T160 needed to be immediately relevant to demonstrate the value of structured reflection to people who had never done it before. Throughout T160 students are asked to reflect privately or to share their thoughts with their fellow students in an online ‘tutor group’. They are also able to include these reflections in a section of the ePortfolio entitled ‘Successes and Difficulties’. In the evaluation feedback, several talked about the impact of this reflective process and how important it had been in allowing them to make changes in their lives. It may be that people on a career break are in a situation which stimulates reflection, and structured activities and tools to support this are welcome.

As students are able to keep the product after the end of the course and continue to use it indefinitely, it seemed highly suitable for those taking short online courses, and for those returning to employment who may need to develop and create several versions of their CV frequently in a short space of time.

Profile is structured as a simple data-base, with templates (See Figs 1 and 2 for examples of these) for students to organise and store evidence and reflection. A ‘report’ feature allows students to specify which fields of information they want exported as text to create a CV or other reports. Features include the ability to record past experience (work, voluntary work, education) as well as future plans, and these include areas for analysis of successes and difficulties encountered. Its simple interface is quick to pick up and can link to files on the student’s own PC. One weakness is that Profile does not allow users to store files of evidence, it only allows links to files held elsewhere. There was also a level of clumsiness in its functionality, such as not allowing more than one template window to be open at a time. These minor functionality issues would have been addressed by the programming team had they been tasked to develop the software further.

4 See http://www.eportaro.com/
Fig 1. Profile screenshot showing Personal Details page

Although ‘Return-to-work’ courses for women have been running in most developed countries for nearly two decades, and there are many very useful workbooks on PDP activities for women, this is, as far as we know the first credit awarding online course of its kind. Therefore it is being thoroughly evaluated, to provide the funders (DTI and ESF) with information about how far it has achieved their objectives, as well as to provide the OU and the course designers with information about how well aspects of the course achieved their objectives. The use of Profile is one aspect of this, and it is this part of the evaluation that is reported here.

Profile is a stand alone software product designed by the OU in-house. The software is downloaded from a dedicated website and also available on CD ROM which is sent out to all students. While it is freely available for all OU students, the T160 course is the only course in the OU that has integrated its use into the activities and assessment of the course and it therefore provides an important opportunity to evaluate its effectiveness. The University is now developing an ePortfolio using open source software, but feedback from the use of Profile will inform the design of any new ePortfolio system.

**Fig 2: Profile Screenshot showing Action Plan and linking to files on local PC**

**Evaluation of PDP and ePortfolio**

**The evaluation methodology**

The course evaluation contains a number of data collection devices: a postal questionnaire sent to all students at the end of the course, a critical incident log sent in by volunteers at the end of the course, and telephone interviews which are taking place eight months after completion of the course, and which are ongoing at the time of writing this paper. Most of the data reported here come from the questionnaire, and a small amount from the first telephone interviews. Data about *Profile* from the questionnaire can only give an indication of student intentions to use it in future, and therefore needs to be extrapolated from with care. It is the interviews that will give better data about what students are doing with *Profile* a significant time after the end of the course.

The first cohort of students who studied in autumn 2005 was sent a questionnaire in the post after they completed the course. A paper-based questionnaire was considered most suitable since most participants were no longer studying with the University and therefore not accessing their OU email address. This questionnaire included six questions about attitudes towards and the uses of personal development planning (PDP) and ePortfolios. 113 women registered for the course, 76 successfully completed it; all registered students were sent the questionnaire. 47 returns were received. The youngest respondent was 22, the oldest 68, and the mean age was 42. Interpretation of these responses should take account of the characteristics of this particular sample.
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The telephone interviews took the comments that respondents had made about Profile and the PDP activities in their completed questionnaire and probed more deeply; asking about other PDP activities or portfolio tools they might have used, and whether they still use Profile and intend to continue to.

**Personal Development Planning (PDPs) in general**

Survey respondents were positive about PDP. Indeed for some the process of reflection had been highly significant. The first of the learning outcomes listed on pages 2/3 seems to have been achieved by most students. One quote illustrates the kinds of comments students made in their questionnaire responses:

*This course helped me look back at my own personal life, to better understand how and why things had happened to contribute to where I am now.*

Table 1 gives the percentage of respondents who found the PDP activities on T160 useful

<table>
<thead>
<tr>
<th>Response</th>
<th>% of respondents</th>
<th>No of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Useful</td>
<td>40</td>
<td>18</td>
</tr>
<tr>
<td>Fairly Useful</td>
<td>49</td>
<td>22</td>
</tr>
</tbody>
</table>

*Table 1: Usefulness of PDP activities (including but not restricted to Profile)*

70% of respondents (32 students) said that they would continue to use PDP as part of their own development. Those who said that they would NOT were asked if there were better ways of supporting their development. Responses very much reflect the situation of these particular women in the context of the problems of employment for women in science, technology and engineering.

For some the course had simply failed to motivate them enough to do more PDP. One commented:

‘*Would need external input to get me to do it’*

Perhaps the most depressing responses were from the few women who felt that they were ‘too old’ (student quote), either for employment or who were resistant to further ‘development’. For them the course did not really achieve its objectives. It was saddening for the course developers to read the following comment from a woman in her early 50s, who wrote

‘*At the age of 51 with 3 degrees and studying for another, and more than 20 years very successful employment I do not want to be constantly ‘developing’ myself. I have many high level skills it should be possible to use- the problem is in identifying opportunities and employers that will “take a chance”.*

Although we did not ask respondents who said they would continue with PDP activities to tell us why, or in what way, one respondent chose to do so anyway. Her comment is an example of how useful PDPs can be for adult learners.

*I have always found it a bit uncomfortable to focus on myself. This course has made me realise the importance of planning and recording my own development. I spend a lot of my time working with young people in my spare time and encouraging their development. I guess I needed some body to do the same for me.*