portfolio and developed later as the individual’s self-knowledge and skills improve. The next challenge would be to introduce people properly to the Internet and to begin developing their informational digital skills. For this purpose, stage four of the ePortfolio process could set as its target to produce a simple ‘register’ of skills and past learning experiences, however modest or informal. To do this, learners could be provided with assistance in searching for the institutions, schools and/or community centres through which they have passed in order to collect evidence about their previous learning. The outcome, an informal record of lifelong learning, could be augmented and validated at a later stage and used e.g. for job search purposes.

Once stage four has been completed, it would be time to introduce the basics of personal development thinking and planning. Hence, stage five would require a discussion with a specialist advisor on one’s own interests, skills, strengths and weaknesses, and what one would like to learn in the future. The basic PDP stage could be supported by a VLE containing easily understandable and ample examples of what the individual could learn, where and how, including links to a limited number of most relevant sites. Another, perhaps more pedagogic and fun way to be introduced to PDP would be a simple ‘role game’ enabling individuals with little or no experience of self-reflection to experiment with alternative identities and possible futures, including different forms of community involvement, jobs and careers. Those who may not ever be employable in the formal work market may still be able to find fulfilment by joining a self-help or community group or through undertaking voluntary work.

When the individual has identified his or her existing skills and interests, positive support would be provided in making a choice of what kind of job or career they would like to pursue. From this point, stage six, onwards the ePortfolio process would begin to resemble that of students in further or higher education preparing to enter the job market. The development of various sections of a ‘normal’ ePortfolio would become the training tool and the first supported ‘work project’ to enhance the individual’s employability. In the process, special emphasis would be placed on teaching the individual strategic digital skills that are essential in searching for, obtaining and keeping a job and in progressing in a career. Those who enter education, training and/or the labour market as a result of the ePortfolio process, would ideally be assigned mentors to support their progress. A mentor would be able to establish and work with any limitations or setbacks on an individual basis as they arise. A longer term mentoring relationship with a mentor who is well placed in the ‘network society’ might be the single most efficient way of facilitating disadvantaged people to overcome structural information inequality and to attain their full potential.\(^1\)

Depending on the individual’s situation, abilities, progress and wishes, the progression through the ePortfolio developmental process can be halted at any stage. The process could possibly to be taken up again at a later stage when the individual’s situation changes (e.g. basic skills or mental health improve). Even if an individual is willing and able to undergo only stages one and two, some benefits would already have been gained in the form of lowering barriers to using ICTs and setting the person in contact with people in a similar life situation.

It appears reasonable to argue that if every citizen is to have, use and benefit from an ePortfolio by 2010 (or at any future point in time); special software and a supported process along the above or related lines are needed. Let us now turn to two ePortfolio projects in the UK that can be considered progressive in the sense of having the potential of enhancing social inclusion.

5. Two UK ePortfolio projects: Highlighting inclusive elements

The potential of any new technology, in this case the ePortfolio, can only be properly explored with reference to actual practice as opposed to abstract speculation. The exploration of the social inclusion enhancing potential of specific ePortfolio projects

\(^1\) It is common practice in institutes of further and higher education, at least in the UK, that each student is assigned a tutor. Moreover, in most work places new employers are designated one or several persons who to turn to in case any questions arise regarding e.g. their training needs, progress review, work-life balance etc. In many cases, trade union representatives are the last port of call. Tutors and trade union officials count as mentors, although they are not always thought as such.
would ideally involve a longitudinal study, combining action research, regular interviews with project beneficiaries and follow-ups on their progress. However, in the period 2004-2005 it appears that most ePortfolio and related projects, at least in the UK, remain at a pilot stage or indeed have yet to be launched. As a consequence, to date, it has been impossible to conduct such a study. Despite this, it is worth reflecting on the progress and development of on-going and ‘soon-to-be-launched’ projects, as the purpose of this paper is to encourage ePortfolio developers to think about how the ePortfolio could be harnessed to enhance disadvantaged citizens’ self-esteem and opportunities to participate in information society. Such thinking may well be stimulated by highlighting adopted, substantive measures through which ePortfolio technology, and those providing related support services, could contribute to enhancing social inclusion. This paper briefly explores those aspects of two different types of UK ePortfolio projects, the City of Nottingham Passport and the Careers Wales Online ePortfolio.

5.1. City of Nottingham Passport

The City of Nottingham Passport (CNP) has been developed in the context of the UK Department for Education and Skills, the Higher Education Funding Council for England and the Learning and Skills Council’s joint Aimhigher Programme. It is geared towards secondary school pupils and college students between the ages 11 and 19 in Nottingham.\(^1\) As the name City of Nottingham Passport indicates, the initiative has so far been limited to city schools and colleges. However, there are plans to expand it to cover all schools and colleges in the greater Nottingham area.\(^2\) It should be pointed out at the outset that the CNP is effectively an end product of an (ongoing) ePortfolio process. The CNP web site defines itself as “a set of documents produced at the end of each key stage to reflect a student’s achievement, progress and ability to manage their own learning”. Furthermore, “[i]t is the result of work done in many areas of the curriculum” and related to the Progress File. The Progress File is a learning tool available at Nottingham Schools that students use for recording and reflecting on their achievements and for practising positive self-presentation.\(^3\) Hence, it might be more appropriate to speak of a Nottingham Schools’ and Colleges’ ePortfolio project than the CNP.

Definitional issues aside, the project introduces pupils from all types of backgrounds to the practice of reflecting on their own learning at the age of 11. This is an early age at which the pupils’ life-paths are still, to most part, undetermined. The explicit purposes of the initiative are to raise student’s self-esteem, support them in planning their studies, encourage them to aim higher, facilitate their transition from one stage of learning to the other as well as their entry to the job market. The CNP web site contains tools to produce, store and modify a personal statement, a curriculum vitae (CV) and an individual learning plan (ILP). It also includes sections in which to record achievement; one section for formal qualifications and key skills and another for keeping record of other achievements. The main summative element of the CNP is the Progress File Certificate that confirms the student’s work on his/her progress file throughout secondary education.\(^4\)

The CNP web site is intended to be used in unison with Progress File materials specific to each relevant ‘Key Stage’ and available at schools.\(^5\) The Nottingham School pupils’ ePortfolio process might be best described as a piecemeal introduction to and work on different elements of basic PDP and recording achievement. The students’ work on Progress File involves recording and monitoring

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1. The portal can be found at <http://www.cityofnottinghampassport.com/index.php> (accessed 07.10.04)
2. See <http://www.nottingham.ac.uk/e-portfolio/news.htm> (accessed 07.10.2004). Mr Phil Harvey from Nottingham City Aimhigher and Dr Angela Smallwood from the University of Nottingham are the most knowledgeable sources of information on the project.
5. The UK school education is divided into five Key Stages. The Key Stages that the CNP supports are those from 3-5. Key Stage 3 is for 11-14 year olds, stage 4 for 14-16 year olds and stage 5 for the age group 16-19.
own achievements, including self-review and goal setting. The ILP, to be first completed at the age of 14 and modified periodically, is tied to exploring career aspirations and identifying possible barriers to individuals’ progress and support needs. The learning planning is aided by links to useful web sites containing information about learning and career opportunities (Smallwood and Harvey 2003).

Although most 11-14 year olds or even teenagers do not count as disadvantaged members of society in the sense discussed in this paper, the Nottingham Schools’ ePortfolio project/CNP could work as a model for developing ePortfolio applications for those with limited basic skills and abilities. First, because it is planned to suit the digital skills and self-reflective capacity level of 11-12 year olds (and above), it is not as complex as applications developed for knowledge workers. It provides clear advice and help in completing each element of the CNP and contains limited number of relevant links to useful websites.

Second, the ePortfolio consists of several elements to which the pupils are introduced one by one as they progress through secondary education (and beyond). Those who enter secondary school start with basic monitoring of their learning with the help of Progress File materials called ‘Getting Started’ (Key Stage 3). In the second stage, they work on self presentation by writing a personal statement to be modified when they move to Key Stage 4 and have worked though Progress File materials titled ‘Moving On’. The outcomes of these two stages of the ePortfolio process feed into the students’ CV. The process continues in the creation of the first ILP at 14. The 14-16 years will have a chance to revise the plan, in part in light of the ‘Widening Horizons’ Progress File materials that they are expected to work though at 16. The age group 16-19 utilises the tool to prepare for a transfer to a further education college, for entry to a university or the job market. This type of ‘gradual progression’ appears important if those with limited basic and/or digital skills (widely defined), computer anxiety, low self-esteem etc are to benefit from the ePortfolio process. Although the development of pupil’s informational and strategic digital skills are not explicitly mentioned as the CNP’s aims, it is apparent that they are being advanced through the piecemeal ePortfolio process.

Third, and perhaps most importantly, the pupils’ ePortfolio process is monitored and supported by teachers who have received guidance on how to best facilitate student’s progress. Such support, including continuous training on a ‘need-to-know’ basis, needs to be available in order for an ePortfolio to function as an empowerment and social participation enhancement tool for currently disadvantaged individuals.

5.2. Careers Wales Online E-Portfolio

The Careers Wales Online E-Portfolio (CW Online) is a regional initiative. It is being developed by Careers Wales Online Steering Group and will be managed by Careers Wales Association, a consortium of seven careers companies that span the entire region. The careers companies offer a wide range of information and advice on careers and learning in Wales. In addition, their responsibilities include the promotion of life-long learning and contributing to the National Assembly for Wales’s social inclusion agenda. The CW Online interactive website is still under construction and it is suggested that it will launched at some point in Autumn 2004. There is currently only a limited amount of information available on the PDP tools to be contained in it, and the accompanying ePortfolio process that the web site and career advisors will facilitate. The relative paucity of information means that any reflections on the tools and the process can be, at best, preliminary and speculative. However, given the nature and scale of the project, even such tentative suggestions may hold value for future social inclusion enhancing ICT projects, in particular ePortfolios.

CW Online is targeted at both young people and adults in Wales, whether in or out of formal education, irrespective of their background, skills level or abilities, although as a baseline, functional literacy will obviously be required. The project’s primary

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2. See <http://www.careerswales.com/> (accessed 12.10.04) for some information on the forthcoming Career Wales Online web site. Rheinallt Jones, ePortfolio Director for Wales based at the Careers Wales North West, initiated the CW Online E-Portfolio in 2000 and has managed the project since.
purposes as stated are to help people to set in motion and to support their lifelong learning and career development process. The CW Online interactive web site will contain a digital progress file, a personal e-portfolio and a tool to create and store CVs and application letters. The exact composition and design of all these elements is as yet unspecified. The limited information available indicates, however, that the personal e-portfolio element is limited to a file or a section in which to store documents. The PDP function is likely to be incorporated in the progress file element. The users of the CW Online will also have a chance to participate in career games and answer career quizzes. Last but not least, CW Online is likely to include links to education/training providers and career opportunities, as well as to ‘social inclusion services’. The social inclusion services presumably include key government services, including those for people with special needs.

On present evidence, it appears that the CW Online initiative has the potential to be a ‘Lifelong Learner’s e-Portfolio’ application in the making, i.e. a tool that brings added value to a much wider range of citizens than students in the formal educational system and/or professionals engaged in vocation related training. First, although school and college students are the most obvious user group and beneficiaries of the CW Online, there have been at least initial plans to put effort into growing the user base. Second, the project is reportedly seeking to accommodate the needs of those that do not possess very good ICT skills. The Careers Wales Association is said to want to encourage the Welsh to use the Online site as an opportunity for ICT training (Moulson and Prail 2004, 43). From the perspective of those with limited operational, informational and/or strategic digital skills, the crucial questions remain of course whether, and what kind of, training provision is provided and whether access to it is can be obtained easily and inexpensive. There is no solid indication as yet whether such provision will in fact be part of the CW Online project.

Third, the inclusion of careers games and quizzes in the interactive web site has the potential of enhancing social inclusion or at least e-inclusion of less advantaged individuals in two respects. On one hand, playing games and answering simple quizzes can work the crucial, first positive experience of using a computer or experimenting with online content. On the other, a career game could (and should) contribute to the opportunities for individuals to consider and, if desired to pursue, new career paths, in which chances of employment, or the prospective of career enhancement would be greater than their present circumstances. Fourth, the fact that the ePortfolio system is offered through a careers guidance provider presents a particular advantage with regard to fostering engagement with the ePortfolio process. If an unemployed person in the UK wishes to receive job seekers allowance, they have to register with a government JobCentre and report regularly on their job seeking efforts. Moreover, disabled people in the U.K. are offered an employment assessment and some training, and are encouraged to formulate an action plan, at these JobCentres. Incorporating these existing types of process into a future ePortfolio process would both allow for the augmentation of the advice and support already given to job seekers and provide a natural point of entry to the ePortfolio system for individuals who have not been brought into the process via the formal educational system. In this context, the CW Online could work as starting point for the development of a social inclusion enhancing ePortfolio application along the lines suggested in the previous section of the paper.

6. Recommendations for improved ePortfolio policy and practice

The overarching goal of this paper has been to broaden the current horizon regarding the values of, and possible and desirable rationales for developing and implementing, ePortfolio systems. The promotional web site for the ePortfolio 2004 conference, to which this paper contributes, indicates that the ePortfolio could be one of the new e-Learning related tools that offers “the means to fully value and empower the individual, the lifelong and lifewide learning citizen”. The recognition of the potential of the ePortfolio as a social empowerment and inclusion tool is a first step towards turning it into one. There are, however, a number of important issues, raised in this paper, to keep in mind when seeking to realise this ideal. First, any attempt to develop a social inclusion enhancing ePortfolio application needs to be grounded in an accurate understanding of the current state of affairs regarding the complex relationship between ICTs and inclusion/exclusion, and the barriers to benefiting from
ICTs faced by different sections of society. Second, any inclusive ePortfolio application has to be able to do more than simply accommodate the diverse needs of individuals with special needs. It ought to contain a developmental element that enables individuals to acquire the skills and competencies needed to benefit from a standard ePortfolio process. Third, any special ePortfolio tool or developmental elements of a ‘Lifelong Learner’s e-Portfolio’ must be developed in active collaboration with those for whom they are designed.

The authors find the term ‘Lifelong Learner’s e-Portfolio’ the most appropriate label for a national or European ePortfolio system geared towards all citizens, irrespective of their background and prior skills or abilities. If such a system is to serve every citizen, from plumber to professor, from someone with intellectual disabilities to a Mensa member, its purposes must be limited. In the authors’ view, a realistic ‘Lifelong Learner’s e-Portfolio’ ought to advance four main purposes. It ought to:

- support people in envisaging or identifying themselves as ‘lifelong learners’ and acting accordingly
- train people with operational, informational and strategic digital skills
- enable people to make their formal and non-formal qualifications, skills and abilities ‘visible’
- facilitate personal and career development and planning

The authors suggest that the Lifelong Learner’s e-Portfolio might be called LEAP for short as the concept captures a notion of a dynamic movement upwards. (Synonyms for leap are rise, increase, go up and jump.) For some the LEAP would mean taking a leap to the world of digital skills training and/or education for the first time. Some would benefit from the LEAP by gaining public recognition for non-formally gained skills, while for others it might involve leaping higher in career life due to enhanced recognition of competencies, digital skills and opportunities at systematic career planning. LEAP appears a good acronym for an innovative, inclusive nation- or European-wide initiative that the Lifelong Learner’s e-Portfolio would be, if it is realised.

In the meanwhile, it is recommended that more attention should be directed towards exploring the ways in which achieving an ‘information society for all’, as called for by the EU, can be aided by ePortfolio applications and appropriate support services. If we agree with the European Commission’s vision of a good society, incorporating “equal access and participation [in the information society] for all in Europe” (COM 2004(380), 17), it would appear justified for governments to play an active role in ensuring that ePortfolio technologies are employed in an inclusive manner. The belief expressed by Europortfolio - ‘in 2010, every citizen will have an ePortfolio’ - can only be realized if all parties work in unison to turn the ePortfolio into an empowerment and self-development tool for all. In the process, ePortfolio initiatives would contribute towards EU and national e-inclusion policies and other central social, political and welfare goals.

In conclusion, it is imperative that ePortfolio technologies are developed and employed in an inclusive manner now and in the future. To advance this aim, the ePortfolio community will need to:

- Widen their horizons and engage in a dialogue regarding the values and rationales for developing and implementing ePortfolio systems
- Deepen their understanding of the relationship between the use of ICTs and the complex dynamics of social inclusion/exclusion
- Make the study of the social inclusion/exclusion effects of existing and planned ePortfolio projects an integral element of their work
- Seek active collaboration with public authorities who are responsible for delivering on EU and national social inclusion and e-inclusion policies

This paper has hopefully provided an initial framework for such work to take place.
References


PS12
ePortfolio assessment and certification
Three Perspectives of Using ePortfolios for Assessment 
Student, Faculty and Administration

**Portrait of Student Success Using Electronic Portfolios**

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**Abstract**: Responding to the urgent need for technology-savvy teachers who are able to effectively integrate technology for improved teaching and learning environments (Carlson & Gooden, 1999; Byrum, D., & Cashman, C. 1993; and NCES, 1999), faculty who teach a mandatory educational technology course to all education majors at West Chester University of Pennsylvania instituted an exit standards based portfolio requirement. Over 600 education majors graduate a year. Over 250 students take a mandatory educational technology course. Portfolios were chosen for student assessment, designed to collect student evidence of technology skills and competencies and provide verification that students embraced the standards of quality teaching as stated in the conceptual framework of the College of Education. The portfolio began as a three-ring binder and over the last five years the use of three ring binders has declined and the use of ePortfolios has emerged.

This paper describes a one-year exploratory study that focused on the process of introducing teacher candidates to use a commercial electronic portfolio system in an undergraduate introductory technology integration course. Each student (n =98) created an electronic portfolio. Data was collected as the students constructed their individual electronic portfolios on-line. Analysis of the process through data collection and observation sought to determine if the portfolio system chosen was economical and met the needs of the students in two ways:

- Could each student prepare a professional ePortfolio that could be used during the interview process after attaining teacher certification?
- Did creating an ePortfolio lead to increased student success?

Every student did construct an electronic portfolio using a modular response system designed by the professor, delivered by a commercial portfolio system. The system collected and aggregated student data in order to generate reports. Analysis of the reports determined more than students’ ability to succeed. Data also informed the professor, upon reflection, of strengths and weaknesses in course instruction that would bear on student understanding. The same data could be used to answer questions about the ability of the University to meet national, state, and university standards and accreditation mandates.

This paper offers the story of ePortfolios, beginning with a broad overview of using ePortfolios with teacher candidates and then focuses on a year long study conducted at West Chester University of Pennsylvania. The University graduates over 600 education majors a year. One professor studied the use of a commercial ePortfolio System, over two semesters, with students (n= 98). Although the study initially focused on student achievement through the use of portfolios, it documents the development of an increased awareness that ePortfolios can serve the interests of the three different constituents: students, faculty and administration.

**Context**

Student ePortfolios in teacher education programs are a personal and professional collection of information describing and documenting students’ achievements and competencies through the evidence collected and presented using digital media. The collection includes artifacts and reflections over time that demonstrates growth, progression, and an evolution of thinking about the philosophy of teaching and learning. Work can be displayed directly and indirectly through descriptions, documents and various forms of evidence.
Portfolios provide faculty and administration with a holistic, dynamic picture of skills and abilities of a pre-service teacher. The portfolio allows the pre-service teacher to demonstrate creatively, evidence of a body of work that shows that they are ready to become a competent, professional teacher with strong teaching practices. Research supports that portfolios are constructive instruments for instructional improvement and authentic assessment (Lomask, Pecheone & Baron, 1995; Wolf, 1999). They can show a comprehensive, development view of teaching and learning of the teacher education program from which they were ultimately derived, as well as a forum for faculty discussion. Beyond faculty, the use of ePortfolios can further promote professional dialogue about teaching and growth towards an active teaching community.

The use of student electronic portfolios in teacher education programs is increasing. They are becoming increasingly required at both the higher education level, as well as marketability for potential employment, as they can showcase a pre-service teacher's skills, strengths, growth and range of achievements. With increased use of ePortfolios comes a broadening of how they are constructed, what purpose they serve, how they are categorized and a raised interest in those who examine the contents relative to the context.

Types of ePortfolios vary based on the goals and purpose of the portfolio: (1) Learning or “growth” portfolios used by pre-service teachers throughout a pre-service teacher education program demonstrate progress over time; (2) “Credential portfolios” require the demonstration of a set of teaching standards by the pre-service teacher; and (3) “Showcase portfolios” allow pre-service teachers to present themselves to prospective employers as a means to highlight their “best work.” (Zeichner & Wray, 2001) Regardless of type, however, most ePortfolios have common elements and include a collection of artifacts and reflections over time that demonstrate growth, progression and an evaluation of thinking about the pre-service teacher’s philosophy of teaching and learning.

Fig. 1 Identifies common elements of the three types of portfolios, regardless of their use or purpose. The strongest portfolio would be a portfolio aligned so that each artifact satisfies all three categories.

Benefits and limitations of specific digital mediums

Choice of medium has traditionally been dependent upon the purpose and goal for creating an ePortfolio and the intent for the ePortfolio to satisfy the requirements of a
specific course or pre-service teacher program. Moving from a paper format to electronic format offers increased benefits that can serve multiple purposes. The National Council for Accreditation of Teacher Education (NCATE) Task Force on Technology and Teacher Education recommends more effective uses of technology in teacher education programs. Electronic portfolios provide the means to collect evidence that demonstrate pre-service students meet the mandates and standards adopted nationally.

Developing ePortfolios provides pre-service teachers with new ways of demonstrating a broad range of abilities. The use of digital medium, according to Bennet and Hawkins (1993), can make crucial contributions to the creation of workable and meaningful forms of assessment, offering potential for collecting and storing student records and artifacts.

Piper (1999) found that the content of ePortfolios demonstrated more meaningful collection of artifacts aligned with course objectives, attributable primarily to the ease of being able to digitize and insert the artifact into an electronic medium. Students with portfolios tended to collect artifacts that were more complete, elaborate and personalized.

Regardless of medium, ePortfolios help students learn and apply new technology skills, and provide unique opportunities for reflection via the digital medium. Each medium, however, has specific benefits and limitations relative to the format. For instance, online tools specifically allow faculty and administration the ability to manage and distribute course materials, review student work and track student progress and assess students' portfolios online. Online portfolio systems include tools that generate reports from data, providing educational institutions with reliable reports needed for accreditation processes.

<table>
<thead>
<tr>
<th>Digital Media</th>
<th>Benefits</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTML / Use of Web Authoring program</td>
<td>unlimited creativity</td>
<td>need host (ISP, domain name or free service w/ pop up adds)</td>
</tr>
<tr>
<td>Dreamweaver, Front Page, Netscape</td>
<td>allows for unique design...the creator's personality can really shine through</td>
<td>Storage capacity per student may be limited based on host knowledge of HTML</td>
</tr>
<tr>
<td>Composer and Microsoft Word</td>
<td>cost saving to student</td>
<td>requires access to a web authoring program and/or knowledge of HTML</td>
</tr>
<tr>
<td>all web authoring tools; some have</td>
<td></td>
<td>some web authoring tools such as Word or Composer have limited functionality</td>
</tr>
<tr>
<td>more functionality and greater</td>
<td></td>
<td>more tech support from faculty or university resources may be necessary, especially if students are unfamiliar w/ web design</td>
</tr>
<tr>
<td>degrees of complexity than others</td>
<td></td>
<td>more cost to university or school if software needs to be purchased</td>
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<tr>
<td>PS12 - ePortfolio assessment and</td>
<td></td>
<td>Use of HTML/ Web format can be complex and overwhelming</td>
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<tr>
<td>certification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>Benefits</td>
<td>Limitations</td>
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<tr>
<td>------------------------------------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>HTML w/ use of a template</td>
<td>Easier for student to follow, easier for professor to grade for assessment because of consistency in format, knowledge of web authoring not necessarily required</td>
<td>Same issues as above templates could limit creativity, storage capacity per student may be limited based on host, x-platform issues may be problematic</td>
</tr>
<tr>
<td>Online Portfolio Services</td>
<td>powerful assessment and report generation for faculty, online customer service available to students (some providers better than others)</td>
<td>Fee-based service templates don’t offer as much room for creativity, some services have limited use of creating rubrics</td>
</tr>
<tr>
<td>Task Stream, Live Text and OSPI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multimedia such as PowerPoint or Hyperstudio</td>
<td>no web authoring experience necessary, online access not required</td>
<td>Portfolio not accessible to the outside world, design functionality not as dynamic as HTML pages</td>
</tr>
</tbody>
</table>

Table 1 Specific benefits and limitations of four types of medium used for for ePortfolios

Only ePortfolio Systems give the broad array of assessment tools that generate reports useful to three perspectives named in this paper: Student, Faculty and Administration. Systems have led to a growing trend amongst higher education institutions to institute ePortfolios. EPortfolios systems implemented at Universities are used for institutional reflection and learning, as well as for assessment of student, course achievement and accreditation processes. Lack of clear evaluation guidelines or standards, as well as poor organization of some types of ePortfolios can present a number of challenges from multiple perspectives when assessing the effectiveness and success of the ePortfolio. Because of varying perspectives and expectations from different constituents (i.e., faculty, students, administration), and lack of consistency or agreement of type, construction and purpose, few specific models or methodologies have emerged that accurately define how university systems use student ePortfolios measure student success.

Research on effective portfolios does suggest that standardized sets of content and contextual information (within an institution) are needed to institutionalize the process.
of using portfolios (Ross, Bondy, Hartle, Lamme, and Webb, 1995) for evaluation. For instance, Johnson J, Kaplan J. and Marsh S.M. (1996) research showed that “the portfolio review process fostered professional development of faculty and served as a catalyst for substantive analysis of teaching philosophy, methods and goals. The portfolio reviews by faculty structured collegial dialogue that served as a powerful motivator for common curricular thinking. The process provided a framework for faculty to think and engage in critical discourse from educational philosophy to teaching models.” Others, at Universities report that electronic portfolios can provide a stimulus for systemic and cultural change (Waddoups, G., Wentworth N. & Rodney, E. 2004).

In a three-year study (1998-2001) funded in part by Pew Charitable Trusts, a cohort of urban universities aimed to examine institutional portfolios and how they enhance capacity of universities to communicate their effectives in achieving their university mission, and accomplishments in the assessment arena. More research and time will determine if the use of institutional portfolios will strengthen the accreditation process and impact institutional and program improvement.

A good assessment system allows students and faculty to have a shared understanding of what constitutes “good work” while supporting administration in meeting state mandates, professional accreditation or other requirements. Helen Barrett (1994) cites Sheingold’s suggestion that portfolio assessment is a social process that is grounded in (1) conversations about student work as evidence of accomplishment; (2) development of common language for discussing accomplishments; and (3) development of shared values and transparent criteria for evaluating student work (Barrett, 1994). These principles guided assessment procedures of this study.

Objectives

The following objectives guided the study:

Objective 1: Can ALL students create a developmental ePortfolio?

Objective 2: What were the system management costs?

Objective 3: What was learned from

- Student/instructor interaction, feedback and reflection
- data collected with a commercial ePortfolio System for 2 semesters: Fall 03 and Spring 04

Procedure

A commercial portfolio system named TaskStream http://www.taskstream.com was chosen for student ePortfolio construction. The commercial product was offered at a reasonable cost, $20 an account, and each student set up there own password protected Internet accessed, on-line space, as part of a class of students. The interface connecting each student permitted access to course materials, assignments, grades, and a communication interface managed by the professor. In addition students could take advantage of just in time technical assistance from the company by calling a toll free phone number. Students were studies during and after the semester.

Data was collected and stored by using the commercial ePortfolio System for 2 semesters: Fall 03 and Spring 04

Students were instructed to buy an account to have access to a commercial Internet provided portfolio system. The cost was $20 the first semester and $24 the second semester. On-line assistance came with the account. The time spent to teach the students how to access course assignments and resources took approximately ½ hour from 2 class meetings. When students accessed their account they found the professor has placed on-line. Students accessed a depository of specific materials and resources, called modules. Each module aligned with specific standards based objectives and criteria of the course. Once students activated an account, they were
directed to respond to each module. By completing all the modules the students would construct an individual ePortfolio they could burn to a CD at the end of the semester. The teacher instructed and guided students to do each of the modules during class time. Students completed each module, as a class assignment, and then attached evidence of their work to the module which the professor aligned with State, content and technology standards. Each student was assigned activities that showed individual work, thought, and competencies. Evidence included an array of products, essays, and/or reflection statements. Students uploaded their completed assignments to their password secured accounts. Assignments were sent electronically to a locked box system to the professor. Upon receipt the work was "locked" and could not be worked on unless "unlocked" by the professor. Students were asked to respond to assignments and were graded in a standards based course, based on their ability to:

- develop teaching strategies integrating technology to enhance learning
- demonstrate understanding of how research informs practice
- collect and present evidence of K-12 classroom field experiences and
- reflect on their portfolio as a professional

**Using the ePortfolio System**

Two classes of education majors were selected to use an electronic portfolio system to construct individual student portfolios. Each student collected evidence of standards based competencies through assignments given by the professor.

**System management costs**

Management costs: Each student paid their own fee for setting up an individual electronic portfolio account. The fee was $20 per account and included on-line assistance and just-in-time assistance with a toll free phone number. This assistance was available 8:00 AM to 7:00 PM.

**Fall 03**

Two classes were selected to use the on-line system. Familiarity with using the system was essential and took time. The students needed 2 class periods to become familiar with functionality and expectations for using an electronic interface to collect assignments, receive announcements, and participate in discussions. As with anything new and different, time was spent to familiarize students with the system and review was essential for the first 6 weeks. The commercial electronic interface selected gave few problems on an individual basis.

**Spring 04**

Two classes of education majors were selected to use an electronic portfolio system to construct individual student portfolios. During the Fall 03 semester the faculty member became more familiar with the functionality of the electronic system. Guided by data collected during the first semester that included, quantitative data in electronically generated reports from Fall 03 and an increased comfort level with the portfolio system, the professor enhanced the interface the students would use the second semester. The second semester the interface was refined in 3 ways.

- modules were renamed indicating the technology to be integrated to enhance learning, emphasizing that technology is not a stand alone but integrated with content specific assignments
- rubrics were aligned with ISTE Standards including competencies and performance indicators
- reflection essays were graded with rubrics emphasizing evidence of including principles of theory into practice and evidence of field experience
Data and Results:

*Fall 2003 Semester 1*

-Student/instructor interaction, feedback and reflection

After students received instruction of how to use the on-line portfolio system, students turned in their work, received comments and a grade. The commercial system stored all the students’ work and tracked all correspondence and grades, and archived the electronic data. The data was aggregated and used for analysis by the faculty member. The students downloaded their work at the end of the semester and saved it on a hard drive or removable disk.

After the first 2 weeks the professor could generate a report tracking how many times students accessed their individual account. This feedback helped the professor identify students who were not actively participating in the learning process.

#1 students and their number of log in times. This data provided indication early in the semester of student’s ability to “access their account” and evidence of their “checking in” to see what the professor is assigning and announcing.

#2 The “modules” Fall 03 showing screen interface of how students see their “working” portfolio. Here is how students see the outline structure of the completed Portfolio indicating each required module.
#3 Grades and comments to student indicating finished work and producing a running report of grades.

Semester 2   Spring   “improved” Modules with name of technology to be integrated with standards based curriculum

Standards Menu to use for alignment of expectations to National, Professional and Accreditation
Selecting Standards and Performance Indicators for spreadsheet Rubric
Standards inserted into Rubrics, This was for a Spreadsheet Lesson

Summary of results

Every student in the study produced an electronic portfolio. First semester the professor focused on each student completing an individual developmental portfolio aligned with content specific standards. The second semester students’ Portfolios were structured in a way that could provide institutional data important for state credentials and accreditation. Student skill building was necessary each semester and the need for assistance was paramount in using the system effectively. Technical Assistance need was greater each semester. The commercial system offered robust functionality, technical assistance and reliability. At the present time, the University is building infrastructure and technology use at an exponential rate. Additional assistance from an outside source relieved some of the strain. Since State Standards and accreditation mandates were used to create the course, data generated is of value to determine success of students. Evidence generated using ePortfolios can be used during accreditation visits and for students to reflect on their level of attaining teacher quality. It was determined at the end of the second semester that the data archived during the ePortfolio process could serve the administration as institutional data needed for national and state accreditation. Although this study focused on only a small representative number of students at the university, greater use of an ePortfolio system depends on institutional decisions. If selection was made and institutionalized the electronic portfolio has the potential to become a vehicle to catalyze the institution toward cultural and systemic change. What emerged from this study is an awareness that students can create their own ePortfolios and find value in the process and product and that the discussion and use of ePortfolio and this institution is at an early stage.

Conclusions and recommendations

This paper gave an overview of the broad subject of Portfolios and presented the results of a study that used a commercial ePortfolio system to achieve student success. The study examined the use of electronic portfolios by students (n=98) and one professor who used a commercial online portfolio system. The one year study documented the experience in order to determine the value of using electronic portfolios. This study presents the conclusion that students, faculty, and
administration could use the same ePortfolio to meet their individual needs. More work is needed to create a systemic process to implement the use of ePortfolios across the entire campus.

References:

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Abstract: This paper reports on research into the development of digital portfolios for arts learning. Using examples from tertiary education context this paper identifies qualities of knowing and considers ways in which digital technologies such as digital portfolios can be utilised to support authentic learning and assessment. The research found that digital portfolios in conjunction with other ICTs are effective in supporting a range of learning in the arts.

Keywords: e-Portfolio, arts learning, dance learning, authentic assessment,

Introduction

Portfolios are not new to the arts, creative industries or arts learning contexts. (Gardner, 1996; Project Zero, 2001) Visual portfolios, show reels and video extract of performances are used often to show evidence of artistic achievement and creative outputs. It is however the affordances of digital or electronic portfolios in combination with information and communication technologies that provide exciting new opportunities to support arts learning and authentic assessment.

This paper draws on the findings of an Australian Research Council Discovery research project that; identified the qualities of artistic knowing across arts disciplines, identified gaps in the present approaches to the assessment of arts learning and teaching and investigated ways that digital technologies might be used to improve arts learning and assessment. The project conducted in 2002 and 2003, included five case studies across five art forms in Dance, Drama, Visual Arts, Media and Music. The principle method employed in the study was Participant Observation Case Study (Jorgensen, 1989; Lincoln & Guba, 1985). Each arts discipline case study formed part of a Multiple Perception Analysis method (Ecker & Baker, 1984) that involved five parallel participant observation case studies undertaken across arts disciplines within a tertiary arts setting. Each case study used digital video/audio recording with laptops to record and manage Digital Multimedia Portfolios (D-MAP). Each Arts discipline case employed a unique approach to the case as required by the specific nature of the discipline.

For the purpose of this paper I will outline the dance case in more detail to identify qualities of knowing for arts making and considers ways digital portfolios in combination with other Information and Communication Technologies (ICTs) can be utilised to support authentic learning and assessment. In investigating the integration of these digital technologies in dance, I have embraced a social constructivist framework for learning which is built not on the traditional “transmission of knowledge” model, but on the assumption that students must become active partners in the construction of knowledge with their peers, academic staff and the wider social context of the disciplines in which they work. (Angelo, 1999; Brown, Collins, & Dugud, 1989; Lave & Wenger, 1991) Building on this theoretical framework, digital technologies can be leveraged in such a way that their use enhances the learning and assessment in the arts. This paper also raised a number issues for curriculum and application developers making recommendations for digital portfolios around the areas of recognition and representation of arts learning, implementation, access, ethics and rights.

The Dance Case Study

Two collaborative choreographic projects conducted with tertiary and secondary dance students provided an authentic learning environment to investigate how digital technologies could enhance learning and assessment. In 2002 and 2003, over two eight-week periods, Queensland University of Technology pre-service dance teacher
artists collaborated with high school dance students via face-to-face workshops and online environments to create dance works. In mixed groups of approximately six students, they produced performances that utilised movement, projected visual images and soundtracks. Throughout the projects, students were engaged in authentic, real world, ill structured challenges (Wiggins, 1989, 1993) that required them to collaborate in teams to create dance works. Student-centred and socially constructed approaches to learning and assessing were integral to the activities of the project and provided “multiple indicators of learning” (Herrington & Herrington, 1998). A range of information and communication technologies such as video conferencing, video streaming and discussion forums were utilised by students as tools in their creative collaborations and web logs were available to individuals for ongoing reflections on the process. Later in the project web based digital multimedia portfolios were designed in collaboration with tertiary students to contribute further to the learning that occurred in these rich and complex authentic learning environments.

Qualities of knowing for arts making - Capabilities for the Creative Industries

In the Creative Industries, as in other industry sectors, practitioners are often required to operate in interdisciplinary teams to design and develop creative products. They employ a range of creative processes, reflective practices and problem solving approaches as they find solutions to complex problems. Further, this necessary collaboration, initiative and innovation are seen as important characteristics of Creative Industries practitioners. As creative team members interact they also need communication skills and cultural awareness to negotiate their way through to a socially shared cognition of the activity. With information and communication technologies being utilised to support distributed work environments of the Creative Industries, practitioners find critical, collaborative and creative ICT literacies increasingly essential. Also vital to engagement in the creative process is the ability to operate as reflective practitioners and share reflective thoughts in reflective conversations. Schon (1991) refers to reflective practitioners using reflection in action as integral to their practice where reflection (thinking about what they are doing) works in conjunction with action informing and enriching their practice. (Schon, 1991) Dance students learning to actively contribute to the Creative Industries need to develop this full range of generic capabilities as well as hone their discipline-specific knowledges and skills.

Fundamental to dance discipline knowing is an embodied kinaesthetic knowledge of dance. As students learn to communicate through choreography and performing activities they heighten their artistic knowing and physical literacies for dance including their spatial, temporal and dynamic awareness. Students working within dance communities of practice become familiar with codes and conventions that are repeatedly referenced in dance. This artistic knowing of dance is socially and culturally constructed as students are exposed to and participate with others in communities of practice (Lave & Wenger, 1991). Actively engaging dance students in authentic experiences provides opportunities for them to construct this knowing in, with and through dance. Providing them with creative learning environments encourages them to explore and exploit these codes and conventions. For students as dancers, this is an embodied knowing that is expressed through their technical and interpretive bodies in movement. For students as choreographers, their knowing is revealed through their creative designing of bodies through space and time. Through the creative collaborative processes of dance making and performing students hone their skills to appropriate, manipulate, explore and exploit dance as they experience it. Assessing artistic knowing in dance may involve assessing a dancer’s embodiment of a particular dance style or it may involve recognizing a choreographer’s emerging choreographic style within their dance work. What is essential is that the dance is central in the assessment process.

Heightening of student aesthetic awareness is also important. As students engage aesthetically through their senses and feelings they come to know more about who they are in relation to the community. Ross et al (1993: 51) see aesthetic education contributing crucially to the development of individual identity, especially to that sense we may have of the expressive and creative self at the core of one’s being.
For curriculum designers in the arts, the challenge is to design learning and assessment that appropriately supports and documents both the discipline-specific knowledges and skills, as well as, generic skills such as reflective practice, problem solving, collaboration and communication. Capturing and presenting the critical embodied moments of design and development that hold evidence of the breadth of learning and provide potential for reflection and planning for future learning is challenging in the context of the arts classroom.

The limitations of existing assessment practices to support authentic learning

Often in the arts and particularly in dance, assessment tasks and their criteria focus on the assessment of the products of the learning such as the student’s creative works and their performances. In doing so they fail to capture and emphasize the breadth of learning that occurs through the creative action of engaging in authentic tasks. It is important that assessment allows for the assessment of both students’ creative processes or action as well as their creative products.

Assessment is often a driver of curriculum. By not explicitly assessing the processes of collaboration, aesthetic knowing, higher order thinking skills, such as problem solving and reflective thinking, these important areas of learning can lose focus in the curriculum and the value of learning gained through rich authentic tasks can be lost. If designed well, the authentic learning context can illicit a range of learning artifacts that hold evidence of students’ capabilities across generic and discipline specific knowledges and skills. The diagram below represents the interdependence between capabilities for the creative industries, authentic learning and its artifacts. At the core is authentic learning, where students are involved in creative action and the design and development of creative products. Through their action and production, they will draw on and in turn develop a range of capabilities for the Creative Industries, as well as, producing artifacts (represented by stars below) which become the highlighted evidence of their learning.

![Figure 1: A conceptual framework for authentic learning in the Creative Industries](image)

Particularly challenging for the performing arts is the ephemeral and embodied nature of experiences within its processes. These are not readily captured by linear text descriptions of critical moments nor are they easily identifiable in the creative and often collaborative process of product design and development. While teachers’ desires to assess these areas in dance have been strong (Smith, 1995), the practicality of assessing them reliably and validly has been a significant issue for curriculum developers. Dance is ephemeral, it is difficult to document the creation of this expressive embodied form. Like other Performing Arts, dance improvisation, experiments and the reflective conversations, unless videoed, remain only in the embodied memories of the participants. Assessment has tended to rely on individual
students’ written documentation to reveal students’ aesthetic responses, creative processes and intention. While journaling enables students to document the conceptualizing, experimenting and improvising that have fed the development of their work; these have most often been paper-based journals that include visual sketches, stimulus materials and written reflections. Previous to the availability of digital technologies any video documentation of the dance-in-progress has been stored separately (Smith, 2002).

Researching digital technologies to enhance arts learning

The research for the project has undergone two phases. Initial research investigated how new Information and Communication Technologies could be utilized in ways that would allow the digital images of choreography-in-process to be focal points for online reflective conversations among creative team members. A number of technologies were incorporated into the learning experiences of the dance class including video streaming, web logging and discussion forums. The technologies were able to be used in combination to develop collaborative student-centred approaches for documenting and assessing processes in dance making. This encouraged students to operate as reflective practitioners and to centralise their dance in these reflective conversations.

In the second phase of the project web-based digital portfolio templates were designed in collaboration with students. It was intended that these student-directed portfolios should encourage dance students to develop their reflective practice skills as they utilize the portfolios to map, track and reflect on their experiences to make more explicit their learning. The pilot templates developed in this collaborative process incorporated a range of features. The portfolio encouraged students to identify evidence of their developing capabilities across a range of contexts in which they operated as learners including institutional, work place and community contexts. A matrix of capabilities and standards provided an opportunity to map and track their developing capabilities. The web based design provided flexibility for students to build multimedia narratives of their authentic real world experiences. The process of collaboratively designing the portfolio raised a number of important issues for curriculum designers and application developers. These continue to inform developments in student portfolio systems at Queensland University of Technology.

Digital Multimedia Portfolios supporting learning

The portfolios developed in this project were very much student owned spaces. Students reflection on and construction of their own understanding of their learning was a central premise to the portfolio design. A matrix of capabilities and standards at introductory, developed and graduate levels provided a structure for students to reference their learning. This referencing process provided a learning opportunity in and of itself. For many years I have worked authentic learning opportunities with all their richness and complexity into my curriculum. As a course designer I am very conscience of embedding a full range of capabilities across a course of study and aligning learning and teaching and assessment with these capabilities. (Biggs, 1999) Applying a criteria referenced assessment approach that makes explicit to students the assessment of these capabilities, goes some way to helping students recognize their learning. The three dimensional nature of the digital portfolio, where students link capabilities, learning artifacts and reflections, enhances students’ metacognition and creates a powerful visual representation of this learning. The following discussion elaborates on ways the portfolio supported dance learning and raises issues for curriculum and application designers.

Portfolios as creative multimedia spaces

Providing flexible creative spaces for students to represent themselves in different ways was recognized as important in template design. Students wanted video and still images of their dance work to be upfront in their portfolios, “so that way you have that live documentation of what has actually occurred rather than of what you think you remember” (Student interview, Oct 2003). In their multimedia portfolios, students were able to draw on written and video artifacts from their participation online to
provide evidence of their developing skills. Providing students with opportunities to develop multimedia technology skills within the curriculum to effectively utilize these flexible spaces is an important consideration for curriculum designers.

**Portfolios as repositories of creative and collaborative work**

The three dimensional nature of the digital portfolio provides a facility to collect and organise over time a body of creative work. This work may include just-forming ideas, works-in-progress or completed works. Having a range of creative works together in one space helps to document the development of students’ artistic skills and their emerging creative voice. A student when reflecting on the value of the portfolio tool when applying for work as a performer suggested that as “they (the potential employers) haven’t seen all the things I have done in the past then I can pull them together to show how diverse I am or what I have done”. This repository, by displaying a rich source of creative material, affords students a more broad reflection on their artistic journey.

As repositories for creative material digital multimedia portfolios also need a set of protocols to deal with possible legal and moral rights that may arise. Creative works may take a variety of forms including video, audio, still images and written text. It may be difficult then to identify the work of the individual within the highly collaborative nature of much of Creative Industry product. Portfolios may prove useful in recognising the work of the individual creative contributor in such a collaborative environment.

The use of digital portfolios in the arts context has also raised a number of ethical and intellectual property issues including:

- Use of photos/videos online
- Personal information
- Culturally sensitive material
- Gender sensitive material
- Appropriateness of creative material i.e. lyrics in audio and text forms in drama
- Discussion about other students and staff in writing or on video

It is important that the protocols established are sufficient to account for this diversity. Simon Chan (2003: 9), a Barrister-at-law, engaged to give advice on the legal consideration of this project recommended protocol should include:

Deeds of consent and agreements obtained by the University from all relevant parties prior to their construction and suitable warnings given not only about copyright infringements but also breach of moral rights. There should be ample protection for the intellectual property rights of students and adequate leeway for the University to exploit the sites appropriately.

Who has access to the portfolio also has significant legal implications as “each time a portfolio is opened and read by another person, it constitutes another publication, and thus a possible legal action” (Chan, 2003). Chan (2003) suggests that:

The fewer the people who have access to these sites, the easier it will be to control who does what to/with them. These sites may be set up with access codes for staff and students only… and on special occasions, be released to the general public after the appropriate release forms are signed by students, or to visitors after they have been vetted by the University.

As the capabilities of technologies are changing rapidly it is also important that any protocols established are regularly reviewed.

**Portfolios as flexible representation of self**

As students contributed to the design of the web based portfolio structure they saw the portfolio tool as a valuable way of representing themselves and their work to others. They valued the creative control over the content of the portfolio from the front page on. Gibson and Barrett (Gibson & Barrett, 2002) proposed one criteria for
the comparison of portfolios should be the approach to creativity, that is, “Does the portfolio approach allow a learner to express their own creativity within the structure of the portfolio?” In interview students commented that they would like to be able to change the look and feel of the portfolio for different work they may apply for. One student stated, “If it is going to a potential employer then it has got to be, Wow, look at this!” (Student interviews, 2002) Even in the second year of a four-year degree, students were focusing on the marketing potential of the portfolio tool (Student interviews, 2002). To this end, they were often hesitant about including assessment work that they had not achieved well in though they did recognize the value of using the digitized artifacts as a focus for reflection. Students also recognized the benefit of being able to critically reflect and evaluate both their successful and less successful experiences of dance. Thus it seems that for a portfolio to be an effective learning tool it must be flexible enough to enable students to present different views of themselves for different purposes.

Portfolios as narratives of authentic learning

Capturing and documenting a diversity of learning through a variety of information and communication technologies enriched the evidence of learning in the portfolios and afforded students greater opportunity to construct rich narratives of their learning experiences. DANTON (Dance Teachers Online), a collaborative website developed within the Queensland University of Technology’s Learning Management System, was utilise to engage student teams in conversations around their developing work. Students were able to make regular contributions to their group’s web page. Over the life of the project this page was enriched from a simple discussion forum site to one that combined a variety of online communication tools included web streaming of dance material, discussion forums and web logs. Students were able to contribute their ideas to an online discussion forum, reflect on the process in their individual web logs and upload video material of the developing work through a video-streaming tool. While the tertiary and secondary students were working through the creative process in their home institutions, they were able to communicate ideas about their developing movement material by video streaming. The video streamed material included instructional segments created by the pre-service teacher artists and dance movement material and rehearsal footage created by both tertiary and secondary students. While the pre-service teachers and secondary school students were choreographing and rehearsing they would select aspects of their developing work they wished to upload for reflective discussion by the team.

This integration of ICTs supported students learning on a number of levels. By being able to upload videoed examples of students’ developing dance material to support the reflective conversations enriched the collaboration online and the creative teams’ ability to socially construct meaning. The interactive nature of the discussion forum provided an opportunity to document the conversations of the creative team. These conversations revolved around the problems and challenges arising in the creative process. Students worked collaboratively online to reflect on their developing work and brainstorm solutions to problems making the documenting and assessing of students’ learning in teams possible. While these conversations mostly relied on the written communication this did not seem to be a communications inhibitor. To the contrary teacher mentors indicated that students were very comfortable with online communications as they were so familiar with using emails and text messaging (Focus Group Interview Sept 2002).

The integration of streamed media allowed conversation to focus around the developing dance work. The teacher mentor when asked if they thought that it was easier to draw out students’ critically reflective comments through that forum space than it would be if they were having a normal discussion in the face-to-face workshops. They responded that it depended on how you would form your questions. As beginning teachers they felt that having time to frame their questions was:

Really beneficial I would say …Cos it's basically the same thing as forming what you’re going to say in a face to face class and made us realize how much you’ve got to think. You have to realize that some of the words we use in normal conversations
they perhaps don’t know the meanings of so you’ve got to bring it down to their level.” (Focus Group Interview Sept 2002)

The teacher mentors also identified that this asynchronous communication allowed thinking time for student responses as well as encouraging contributions from those students who may not have contributed in face-to-face communications.

You can bring it out of the kids who may not have been able to speak up in a face to face but have the opportunity to express how they felt. (Focus Group Interview Sept 2002)

As this project provided limited opportunities for students to meet face-to-face, team members relied heavily on discussion forums for communication. This is not likely to be the case where creative teams meet regularly however the opportunities that this strategy provides to focus learning and assessment on reflective practices makes this strategy worthy of consideration in the suite of assessment tools available to teachers.

Being able to provide an online space to document students’ reflective thinking and collaborative problem solving in ways that kept the dance central to the conversation is a powerful tool for documenting and assessing the ephemeral learning of dance. In the kinetic and often frenetic space of a dance classroom is it difficult to identify and capture such learning. At a pragmatic level there are difficulties arising from the nature of dance classrooms. The fact that numerous groups are working in the same classroom space with all associated noises means capturing by video significant moments that reveal the application of critical and problem solving skills are difficult. In personal interview (May 2002) I made the following observations as teacher/researcher:

The quality of this (videoed) data was poor due to issues of noise with an overcrowded classroom. This is a unique problem to dance, as there are often a number of groups playing different music. A second difficulty was having only one camera and the lecturer’s inability to record critical moments of 6 groups positioned in 2 rooms. While some moments were recorded it was chance whether critical data collecting moments were captured due to the teacher/researcher inability to know when this critical moment might happen.

If the assessment of process is teacher-centred and relies on teacher observation and documentation of these processes then the following question arise: Does this monitoring approach to assessment encourage students to develop a broad range of capabilities as an integral part of their dance practice? By encouraging students to identify, document and assess, for themselves and their peers, those critical moments in the creative process that evidence collaborative problem solving the assessment process becomes more authentic and student directed. Using peer and self-assessment strategies aligned through criteria to the generic and discipline specific capabilities (Biggs, 1999) also support students to construct their own understanding of the learning that has occurred.

As students considered the range of capabilities they wished to evidence in their portfolios they were able to source many artifacts from their online engagements. By combining a variety of artifacts with descriptions and reflections they were able to tell stories (Barrett & Wilkerson, 2004) of their engagement in authentic learning. In the process of constructing these narratives students’ understanding of their learning was enhanced.

While digital video examples of students’ dance work were readily available for incorporation into the portfolios, the interactive discussion forums and web logs had to be captured as still images or converted to word documents as these artifacts were located in the university’s learning management system. Software to capture websites was not readily accessible at the time. Although website copying tools are now more readily available these challenges do raise issues for application developers around the interoperability of digital portfolios systems, learning management systems and the tools they support.

How these artifacts are displayed in the portfolio is also an important consideration for application developers. As previously discussed placing the embodied
experience of dance central to the students’ reflections is vital. When asked were there any surprises in using portfolios, a student responded, “probably just how effective it was having the written [descriptions and reflections] next to live examples” (student interview, Oct 2003). Later the student explained further:

Often we have to reflect without having any visual stimulus to go on. So sitting there and actually watching yourself, breaking it down and looking objectively. And saying oh this positioning wasn’t right but this was effective. I think for students they are going to enjoy watching themselves on camera, rather than just saying ‘in our groups we did this’. They get to see themselves dance and be a bit of a starlet and they are going to put more into it.

The portfolio should afford students the opportunity to view their creative work alongside their online reflections to enhance the critical thinking and deepen their learning.

**Conclusion**

The general trend in educational assessment is toward authentic assessment that it is more concerned with ‘real life’ models. Assessment of students’ reflective practices that work to document capabilities through their engagement is therefore a step toward improving and broadening authentic assessment practices in dance. Using digital portfolios in conjunction with other ICTs provides us with opportunities to design interactive environments that connect creative teams and their dance artifacts. The strategies described here have gone some way to considering how digital technologies can provide new opportunities for dynamic conversations that have the potential to evidence students’ constructed knowing and make more visible to students their discipline specific and generic capabilities.

**References**


The e-portfolio: supporting a European route to adult basic skills certification

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Abstract: This short report is a ‘work-in-progress’ and will highlight use of the electronic portfolio (e-portfolio) in supporting a European route to adult basic skills certification. European Certificate in adult Basic Skills (EUCEBS – www.eucebs.org) is a Leonardo da Vinci funded pilot exploring development of a certificate of basic skills across eight European countries concurrently. There are two methods of assessment: the direct test and the portfolio. The portfolio can be paper-based or electronic - this paper will explore the electronic portfolio component discussing the benefits and some challenges faced.

Keywords: Electronic portfolio, portfolio assessment, European adult basic skills, EUCEBS

Background
European Certificate in adult Basic Skills (EUCEBS – www.eucebs.org) is a Leonardo da Vinci funded pilot exploring development of a certificate of basic skills across eight European countries concurrently. EUCEBS is competence-based and the learner may obtain certificates in six domains: Citizenship; Communication; ICT; Interpersonal Skills; Learning to Learn, and Numeracy. The target audiences are those without formal qualifications and the EUCEBS partners work with a wide range of clients including school leavers, immigrants and prisoners. The pass level is set at approximately the end of formal schooling.

EUCEBS employs two methods of assessment: the direct test and the portfolio. The direct tests can be paper-based, computer-marked or demonstration of competence in front of a qualified assessor. The second method of assessment, the portfolio, may be paper-based or electronic. Portfolio assessment is indirect in that the assessor may not see the demonstration of the competence, only the “product” or a representation of it. For portfolio assessment the types of materials presented may include: certificates; written/drawn documents; physical artefacts; computer-produced documents; images; video clips and audio clips. These can be created within a training centre or brought from previous employment or education.

Our reason for employing two methods of assessment (direct and portfolio) is so the learner can choose their preferred route to certification. Many learners undertaking basic skills training have an aversion to formal tests; therefore, the portfolio option is an incentive as it removes the testing ‘hurdle’. Portfolios are more appropriate in settings where APL or APEL is important. It is possible within EUCEBS to “mix and match” assessment types, as some domains lend themselves more to direct testing whereas others are better suited to portfolio assessment. The choice lies with the learner, in discussion with her/his trainers and advisors.

What is an electronic portfolio (e-portfolio)?

The e-portfolio is an information management system that uses electronic media and services. The learner builds and maintains a digital repository of artefacts, which they can use to demonstrate competence and reflect on their learning. Having access to their records, digital repository, feedback and reflective notes learners can achieve a greater understanding of their individual growth and career planning. Accreditation for prior and/or extra-curricular experiences and control over access makes the e-portfolio a powerful tool.

Note: A digital artefact is any electronic media, for example: a word document; a video clip; a digital photograph.
Our main objectives in building the EUCEBS e-portfolio system involved devising a manageable structure in which:

- The learner can upload digital artefacts into their own personal, private repository. This is an area where the learner can place as many objects as they wish, review and revise them all in privacy.
- The learner can select artefacts and 'submit' them to the trainer for comment and feedback. The trainer is alerted to the presence of such materials when s/he enters the e-portfolio system.
- The trainer can comment on and return artefacts, alerting the learner automatically to their presence.
- The learner can store her/his reflections within the e-portfolio.
- The whole transactional process is recorded for accreditation and security.

**Challenges**

We faced some challenges during the design of the system. Firstly, interface design and layout: given the target audience, a clean, easy-to-navigate interface that adheres as much as possible to disability guidelines for web-based applications was required. Systems which follow such disability guidelines generally have improved navigation and usability for all users. Secondly, functionality for the learner: to track easily their learning outputs, submissions, competences demonstrated successfully, feedback received and to input their reflections on their progress.

The level of ICT skills required to set up, use and maintain an e-portfolio is fairly high for novice computer users. This is an important issue for us as some of EUCEBS’ learners have never used a computer. A learner who uses and maintains their own e-portfolio will demonstrate most of the ICT skills required to pass the EUCEBS ICT domain; however it is important not to leave those behind who do not yet possess these skills. Mechanisms are being devised to cope with this. A new feature was developed giving a tutor access rights to begin creating and maintaining a learner’s e-portfolio until that learner (a) has the required skills and (b) the confidence, to take over their own e-portfolio. The means, regardless of skill level, learners can have their e-portfolio running from the moment they begin EUCEBS training.
Focus has been placed on learner engagement, discovering ways for active participation and monitoring the development of an interactive learner/trainer management system.

The e-portfolio for reflection

The term “reflective e-portfolio” is not immediately meaningful to many learners, and especially so within our group who are not comfortable learning in formal settings. Indeed, one of the EUCEBS domains, Learning to Learn, is reflective by nature and has shown to be a difficult skill to develop. In the context of EUCEBS, the presence within the partnership of seven languages complicates the issue, as reflection on learning is conceptually demanding. Some of our learners, migrants for example, do not have good language skills within the country in which they now live. The EUCEBS e-portfolio has been designed to work in multiple languages for use across Europe.

Evolving with the learner

By its very nature the e-portfolio is a fairly complicated tool with many levels and options. The key for a project like EUCEBS is to develop an e-portfolio that can start out as simple as possible with the potential to evolve and expand as the learners’ needs, confidence and expectations rise.

In the initial design and build of the EUCEBS e-portfolio a central element was navigation and ease of understanding. It was essential to minimise the number of screens and the amount of ‘clicks’ through menus. The less time a learner spends negotiating the system the more time they spend actually using the tool. In the case of EUCEBS simple is best. With the correct design architecture it is possible to build a system that is simple upon inception yet allows for new modules and functionality to be added as and when required.

Improved logistics

The e-portfolio - and a big appeal for EUCEBS - makes an efficient storage system and an excellent method of managing evidence gathering, all contained within a date ordered, category defined digital repository. This is a big advantage over the paper-based model where the logistics of managing so many artefacts over time is difficult and time consuming.

Accreditation of prior learning

A facility to award credit for prior learning is invaluable within adult basic skills certification. Many of the learners EUCEBS target possess skills that they do not realise. Our French partners in CPE\(^1\) commented that many of their learners are unaware of the skills they have especially in context to formal learning. Awarding these learners credit for their experiences, perhaps digitising some materials and placing these in the e-portfolio instils a degree of self belief. This can provide learners with a powerful driver to continue with the program. It encourages a real ‘can do’ attitude – this is an excellent attribute of the e-portfolio. Figure 2 demonstrates the types of items that can be used when accrediting prior learning from non-formal arenas.

\(^1\) http://www.cpe.asso.fr/
Standards and Interoperability

The EUCEBS e-portfolio was originally designed and built as a stand-alone system for use solely on the EUCEBS project. Much of this was due to the initial brief – designing the EUCEBS e-portfolio for assessment of the EUCEBS certificates. However in order for e-portfolio usage to reach its full potential e-portfolio systems need to ‘talk’ to each other. Future versions of the EUCEBS e-portfolio will adhere closely to any emerging e-portfolio standards and in doing so should take a large step towards (a) interoperability with other systems and (b) giving learners the option of an e-portfolio for life.

Conclusion

The EUCEBS e-portfolio is addressing some of the problems associated with effectively assessing domains such as communication and interpersonal skills through providing a medium where learners can upload audio and video samples generating excellent artefacts demonstrating competence in these domains. The capacity to utilise technology such as video greatly enhances the process and possibilities for both learner and trainer. Portfolio assessment presents our learners with a viable alternative to formal testing at the same time as developing their overall control over their learning and assessment.

Future developments

Future developments include: addressing interoperability issues, building a facility for learners to create their own public interfaces, showcasing their achievements and the continuation of trials with learners from across the EUCEBS project. The results will be available early 2005.

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Using ePortfolios to assess the Reflective Capabilities of Medical Students

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Abstract: This paper discusses the evaluation of an electronic reflective portfolio piloted at the University of Leeds School of Medicine in the 2003/4 academic year. The authors will use guidelines derived from the original project aims to examine staff and student feedback and identify a direction for the next implementation of the system.

Key words: ePortfolio, portfolio, reflection, medical education, assessment

Background

Portfolios are used widely in medicine as part of professional revalidation and appraisal to assess the professional attitudes of doctors. Portfolio assessment has also been identified by the academic community as a means of measuring student attitudes to learning. Following the recommendations of the ‘Tomorrow’s Doctors’ report published by the General Medical Council (GMC), portfolio assessment has been extended to medical undergraduate education and has been adopted by many UK medical schools. As a response to the GMC report the Universities of Leeds, Newcastle, Sheffield and Dundee have collaborated on the Managing Environments for Portfolio-based Reflective Learning (MEPRL) project to develop in house ePortfolio systems. The Leeds reflective portfolio was introduced to second year students both as an online and paper based format as part of the MBChB Personal and Professional Development course unit. The 265 students were organised into eighteen groups overseen by a mentor. Four student groups were chosen to pilot the ePortfolio, which had been set up within Leeds University’s virtual learning environment: Bodington.

Aims

The aims of the MEPRL project are as follows:

- To develop an on-line portfolio system to support a reflective approach to evidencing the attainment of programme outcomes.
- To promote the development of the reflective capabilities of medical students, giving greater responsibility for managing their own learning and preparing for aspects of work-based and lifelong learning.
- To develop strategies to facilitate assessment of curriculum outcomes that are not amenable to traditional instruments of assessment.

In order to focus the evaluation strategy of the project, the project evaluator David Baume refined these aims in a goal sharpening exercise and presented his report to the working group committee. The report outlined the overall evaluation approach:

The evaluation needs to determine how and how far students have developed these capabilities.

Before that, it needs to determine how and how far medical educators have sought to develop these capabilities in their students.

And, before that, it needs to determine how and how far the project has inspired and enabled medical schools and medical educators to develop these capabilities in their students. (Baume, 2003)

This paper will discuss the results from the Leeds evaluation in relation to this evaluation strategy and identify how the Leeds project team can improve its ePortfolio.
The project group adopted an ongoing evaluation strategy using a combination of questionnaires, focus groups and interviews. Both staff and students were questioned.

**Pre-Questionnaire**

A Pre-Pilot student questionnaire was distributed to 251 students during the portfolio launch seminar at the beginning of term. Students were asked to write down their feelings towards portfolio assessment, both paper-based and electronic after the seminar.

The questionnaire began with a quantitative survey using a scale of strongly agree, agree, neither agree/disagree, etc. Questions included:

- *Which method do you prefer?*
- *The section on the portfolio (referring to the study guide) was easy to understand.*
- *Following today’s lecture I understand what portfolio based assessment means.*
- Students were asked to complete two statements at the end of the questionnaire:
  - At this moment my positive feelings towards the portfolio are:
  - At this moment my concerns about the portfolio are:

**Focus groups and interviews with staff and students**

In November 2003 a focus group meeting was arranged with PPD Tutors piloting the ePortfolio. The group gave feedback on student usage of the portfolio and exchanged ideas on how Nathan Bodington resources could be best utilised for supervising student groups.

The Learning and Teaching Office organised the First and Second Year Feedback Discussion Groups for the 10th February. Four members of staff chairing the Year Two groups were asked if they could direct part of the discussion to the ePortfolio.

In May the project officer and course manager interviewed two mentors on their use of and feeling towards the ePortfolio. The mentors Barry Ewart and Rose Watson are referred to by their initials (BE and RW) in the discussion of the evaluation below.

**Post Questionnaire**

A post-pilot questionnaire was distributed to 251 students at the completion of the pilot phase. The questionnaire used a combination of quantitative and qualitative questions. As 52 of the 251 questionnaires were returned, the authors felt that the results were not representative of the overall student group. This paper will focus on Qualitative questions, as the data represents the overall opinions and feelings of students during the pilot phase. One reason for a low response rate may have been because staff regularly requested feedback from their students during tutorial sessions. Students may have felt that staff were already aware of the positive and negative issues surrounding the portfolio and were thus less motivated to fill in the form at the end of the pilot phase of the project.

**Discussion of Results**

This section will discuss the results within the framework of David Baume’s recommendations from his Goal Sharpening report.

*How the project has inspired and enabled medical schools and medical educators to develop these capabilities in their students.*

For the purpose of this paper the emphasis will be placed on Leeds medical educators.

At the beginning of term, mentors received a briefing about the portfolio from the PPD course manager. Staff also received a copy of the course study guide
explaining reflection and detailing various approaches, such as Kolb’s Learning cycle.

Technical training was provided prior to the beginning of term and technical support was offered by the IT Project Officer to mentors who needed it. The VLE lead developer, Jon Maber, also assisted with the training and offered advice on the training documentation.

**How far the project has inspired and enabled medical schools and medical educators to develop these capabilities in their students.**

Both mentors interviewed recognised the need for reflection, but it is not clear whether they held these positive views before the project, or developed these opinions during the pilot phase. Both mentors were new to portfolio assessment and although “apprehensive at first” (BE) about supervising a portfolio they later came to appreciate the process. RW enjoyed using the communication features of the ePortfolio. “Enlightening” was the phrase she used to describe the system, followed by: “Can we continue it?”

The project experienced more difficulty introducing ePortfolio assessment to the Clinical Skills course managers. The log book format of the PPD portfolio didn’t fit with their perception of portfolio assessment. At the time the Clinical Skills module used a skills audit approach. Each skill was assigned a set of competency levels (i.e. confident, can do under supervision, not confident, etc.) that was difficult to replicate using other applications in the VLE. Students were also required to have a skill observed and signed off by a clinical supervisor. The project team agreed that signing off skills online in a hospital environment would have proved impractical (if not impossible). Developments in PDA technology have recently made this a possibility and the use of PDA’s may be explored as part of another project.

It was evident; both from the evaluation and first hand observation of staff training that staff found the ePortfolio web interface difficult to use. In the focus group and the post-questionnaire students commented that staff didn’t understand how to use the technology and were slow to respond when students uploaded new work (this feedback contrast with those students who believed the portfolio had facilitated frequent communication between themselves and their mentor). It is possible that the technical difficulties faced by the staff may have affected student’s confidence in the portfolio and reflection process. The ePortfolio web interface was beyond the control of the project officer, responsible for setting up the computer software. Due to the lack of time the project team chose to use existing applications provided by the Bodington VLE. These applications had advanced web interfaces that were originally designed for university staff who had received training from the VLE service. Over the course of the pilot mentors became more familiar with the ePortfolio tools. During her interview RW commented that her overall computer skills benefited as a result of working with the ePortfolio.

**How have medical educators sought to develop these capabilities in their students**

Interviews with the ePortfolio mentors give some insight into mentors working methods when overseeing the ePortfolio student groups. For the first two weeks RW introduced the students to ways of reflection such as Kolb’s learning cycle and critical analysis. RW felt that there wasn’t enough stimuli on the course to help fulfil the learning objectives. She decided to get her students to work in groups, create presentations on poverty and reflect upon how they created their presentation. RW commented that “many students found this a useful exercise.”

BE attempted to use VLE tools, such as a discussion forum to exchange ideas and trigger thoughts. BE posted discussion topics based on handouts from lectures that dealt with topic such as poverty on deaf awareness and culture. BE then prompted his group to “draw on the lecture to meet the various objectives” using the discussion board as the group communication medium.
Although no intermediate deadlines were set for the assessment BE attempted to foster a serialistic learning style amongst his students. Students in his group had to partially meet five objectives by December 2003. BE also posted progress reports on to the discussions forum detailing what objectives had been met and by whom. Students could benchmark their own progress against other members of the group. Initially the students started engaging with it, but after a couple of months this peteria out. One possible reason for the decline of the discussion forum may have been because students weren’t assessed on their contribution, and thus chose to concentrate on the assessed area: the ePortfolio.

BE monitored the ePortfolio “more than twice a week” and found it an efficient means of managing his portfolio group:

“Well it's quite straightforward to see because, when this appears [waits for the page to load], you can see the list of names. … So if I've checked on the 14th Feb it would say next to [indicates students name]: ‘new entry since you last visited’, so at least I know. … Instantly you can see if anybody's posted any work.”

**How far have medical educators sought to develop these capabilities in their students?**

Staff and students agreed early on in the pilot that the PPD course unit outcomes which provided the assessment framework for the Portfolio needed to be simplified. Students also felt that they had been 'forced' to reflect on issues they knew little about and had insufficient experience in order to meet the objectives and pass the assessment. Both paper based and ePortfolio groups were inspired by the Tuesday lectures and expressed disappointment that the learning outcomes didn't follow the same themes explored in the lectures and group discussions. Many students suggested that there should be a choice of topics to reflect on:

“More practical, i.e. more simulated patient interviews.”

“Encourage recorded discussion as opposed to written reflection - wasn't really aware that I could do this though I would have found it more helpful than writing about some of the objectives”.

Students also expressed dissatisfaction with consistency of the assessment as interpretation of the outcomes varied between mentors. With regard to mentor feedback: several students felt disillusioned by the exercise when opinions expressed in their reflective accounts were dismissed as unacceptable by their mentor. One student wrote:

I felt a lot of the time I was writing things that I may not have really thought but that I knew were appropriate and would fill the objectives, mainly because I did not have any real views on the subjects…not enough life/medical experience…everyone thinks about the things that came up, even if their opinions are non-pc don’t think this would have helped…to be told my opinion is not enough to meet an objective is disheartening.

This raises some questions with regard to the limitations of reflection in medical education. Are we teaching students to simply exhibit a professional attitude, or do we want to change (or re-affirm) their attitudes? Isn’t it preferable to create a safe non-judgemental environment where attitudes can be discussed and hence open to change, rather than a student simply regurgitating a politically correct point of view?

**How have students developed reflective capabilities?**

When the evaluation data was first reviewed it was difficult to determine whether the ePortfolio tools influenced the depth of student reflection. Post-question data suggests that the pilot ePortfolio simply acted as a transcription tool for reflection. However the interviewed mentors commented that their student engaged more with the ePortfolio than the paper based version. A re-examination of these interviews shed light on two attributes common to both the ePortfolio and how medical students reflect: structure and dialogue.
RW mentioned that her students structured their reflection around Kolb’s learning cycle, one of the processes taught in her workshops. When discussing medical students’ grasp of reflection RW believed that “most students tended to compartmentalise things” rather than think holistically. This scientific way of thinking is at odds with the process of reflection, although as one student implied in the post-questionnaire, the structured and logical nature of a computer program, helps students to organise and arrange their thoughts and ideas:

“Having heard from friends that did not have the opportunity of doing the E-portfolio I think it is an improvement. The whole process felt more structured and easier to handle when kept in a ‘central’ place.”

In the post-questionnaire students made many positive comments on how the ePortfolio helped them sustain a dialogue with their tutor. During his interview BE gave an example of how his supervision of the ePortfolio prompted a student to expand on a reflective entry in her portfolio:

[Using a web browser BE navigates to a student ePortfolio.] “Right so Kerry has posted some work … and I've put ‘Good reflection, you can build on this through some reading’. So I've given her some instant feedback...she's listened to what I said and she's posted a few extra paragraphs.”

The success of the ePortfolio as a stimulus for dialogue was determined by how often the mentor’s monitored the portfolios for their group and most importantly their enthusiasm for using the technology. BE stated that students with ePortfolios recognised the advantages of a web based system when speaking with colleagues who were keeping paper based portfolios.

“I think, well obviously, students discuss with other students in groups who are doing it paper based and I think the feeling I’m getting is that those who do it online think it's better to do it online because they … get instant feedback.”

Usability and reliability of the VLE were negative factors that undermined students’ confidence in the process. Some students experienced difficulty uploading work from a dial-up connection at home. Unexpected down-time of the VLE on demonstration day, caused by a server failure, further undermined the credibility of the VLE as a suitable vehicle for the portfolio.

How far have students developed these capabilities?

Initially students had difficulty grasping the concepts of reflective learning and both the interviewed mentors commented that their groups were accustomed to a structured science-based education used to “compartmentalising” skills and knowledge rather than adopting a more holistic viewpoint. However BE noted that once students began to understand reflection “they started to value it”. One student said that reflection 'makes you think too deep and forget the real issues'. Although this was intended to be a rejection of the reflective process it hints that students were engaging in reflection whether they liked it or not. Although the individual was uncomfortable reflecting, she was engaging with the process nevertheless, apparently on a deep level. We can only speculate on what is meant by 'the real issues'. Are the 'issues' the topics discussed in the Tuesday discussions, or is she referring to clinical experience?

In the post questionnaire students were asked for their opinions on the positive aspects of the reflective portfolio. Many students felt that the portfolio had helped them to acquire or recognise existing reflective capabilities and valued the reflective processes they had been taught. The responses were compared with reflective attributes identified in a delphi study carried out by the University of Newcastle using feedback from academics from the University of Leeds (Cotterill 2003). This comparison, illustrated in Figure 1 below, implies commonality between attributes
identified by staff and qualities that students, themselves believed that the portfolio had helped them develop.

<table>
<thead>
<tr>
<th>Attributes of a 'reflective approach to learning' identified by academic staff in the Delphi study, including examples.</th>
<th>Students' responses to the question: What were the positive aspects of the reflective portfolio?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emotions</strong></td>
<td>It gave us an opportunity to take our teaching to a different level, to recognise issues which we had subconsciously thought about but not really brought to forefront.</td>
</tr>
<tr>
<td>Recognising feelings (emotions) after an experience</td>
<td>Chance to recognise issues subconsciously thought, but not brought to the forefront.</td>
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<tr>
<td>Understanding why I feel this way</td>
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<tr>
<td>Emotional intelligence</td>
<td></td>
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<tr>
<td><strong>Empathy</strong></td>
<td>A chance to reflect on what I've learnt, how I've changed</td>
</tr>
<tr>
<td>Ability to empathise with patients and relatives</td>
<td>It helped us look back on what we had learnt and what we needed to do better. It made us think of things we may not have thought of other wise.</td>
</tr>
<tr>
<td>Ability to empathise with fellow health workers</td>
<td></td>
</tr>
<tr>
<td><strong>Observation/Reflection</strong></td>
<td>Makes you think about the role of doctors</td>
</tr>
<tr>
<td>Reflective observation – reflection in action</td>
<td>It encouraged critical thinking and self-evaluation, something which is not present in any other aspect of the course.</td>
</tr>
<tr>
<td>Identifying what I have learnt</td>
<td>Being made to take a different stance on being a medical student and a career in medicine.</td>
</tr>
<tr>
<td>Identifying achieved learning outcomes</td>
<td>Gave me the chance to look at myself and my medical career and assess and reassess my attitudes.</td>
</tr>
<tr>
<td>Identifying unexpected learning outcomes</td>
<td>It did give me a chance to look at my medical career and assess my attitudes.</td>
</tr>
<tr>
<td>Identifying the learning process(es)</td>
<td></td>
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<tr>
<td>Group reflection</td>
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<td><strong>Analysis</strong></td>
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<td>Analytical skills</td>
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<td>Critical reflection</td>
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<td>Attribution – understanding what has affected performance</td>
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<td>Abstract conceptualisation</td>
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<td>Dispassionate self-analysis</td>
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<tr>
<td>Synthesis of ideas and learning experiences</td>
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<tr>
<td>Setting aside time for regular self-review</td>
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<tr>
<td>Critical incident analysis</td>
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<tr>
<td><strong>Recording</strong></td>
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<td>Recording achievements</td>
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<tr>
<td>Regular documentation of formal and informal learning</td>
<td></td>
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<tr>
<td>Effective communication of learning and development e.g. RITA</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Comparison of student feedback with the Newcastle delphi study.
### Self-Knowledge
- Identifying my motivations
- Identifying my capabilities
- Identifying my limitations
- Understanding how I learn
- Knowing my strengths
- Knowing my weaknesses
- Understanding expectations of me as a medical student

### Planning
- Forethought
- Planning skills
- Setting objectives
- Self-evaluation
- Identifying learning objectives
- Identifying intended learning outcomes
- Identifying learning needs
- Identifying opportunities

### Action
- Adaptive approach
- Applying learning to different contexts
- Ability to prioritise
- Independent Learning
  - Seeking feedback
  - Seeking opportunities
  - Self-monitoring
  - Pro-active dialogue with supervisors/assessors

"Made me consider a wide range of topics, promoted personal development and our ability to assess ourselves and our peers and evaluate our progress".

"...encouraged independent working"

### Comparison with Delphi Model:
The above comparisons are confounded by the model of:
- Unconscious incompetence
- Conscious incompetence
- Conscious competence
- Unconscious competence

In that only aspects in the conscious zone are recorded, whereas operating in the zone of unconscious competence is the aim of reflective practice. It may be possible to receive a more accurate picture by combining one student’s self-assessment of the above with peer-assessment. In addition, students may have seen some items in the model as ‘a given’ and thus unworthy of comment.

### Lessons Learnt and Future Plans

**About the ePortfolio**
Feedback from staff and students prompted ePortfolio developments in these areas:
Usability of the ePortfolio interface

In order to reinforce user confidence in the ePortfolio the user interface must be as intuitive as possible. This is particularly important when users have little or no experience of using web based computer interfaces. A collaborative project in association with the University of Manchester and the VLE vendor (Bodington.org) has condensed two of the VLE applications (a file container and an online log book) into one tool and has streamlined the process that allows students to link reflective log entries to evidence stored in the portfolio.

Clinical skills

Building on the functionality outlined above a new collaborative project between the Universities of Leeds, Oxford and Liverpool will attempt to develop a skills profiling web service that matches the work book format favoured by Clinical Skills course managers.

About Assessment of Reflection

Mentors for this course are the existing tutors in the Communication Skills team. Although there is correlation regarding certain aspects of reflective practice, the degree to which individual mentors are familiar with reflective practice and capable of being non-judgemental are variable. Therefore students had very different experiences of reflective practice within the groups. There is a need to develop homogeneity regarding pedagogic approach.

In view of the above there was much concern about the final assessment. It was decided to use the BPR model:

- Noticing – memorized representation
- Making sense – reproduction of ideas, ideas not well linked
- Making meaning – meaningful, well integrated, ideas linked
- Working with meaning – meaningful, reflective, well-structured
- Transformative learning – meaningful, reflective, re-structured by learner, idiosyncratic or creative

(Moon 2002)

Mentors were paired up and work was assessed using the above model. If there was disagreement/doubt about the grade then an additional mentor would moderate the work. In the event there was homogeneity regarding assessment, which is contrary to previous research in this field.

There is no doubt that learning is assessment driven: The portfolio was set up as a pass/fail assessment. However, in order to enable students to gain an honours point from ‘Personal and Professional Development a ‘Very Good Pass’ category was introduced in March. This increased engagement about fulfilling objectives, but at the expense of the process. Perhaps the best of all worlds can be achieved by the ePortfolio becoming a formative assessment so that it can be more active, spontaneous and authentic? The project will run with this. Formative assessment of the ePortfolio will be a passport assessment. This means that students cannot progress and take the summative assessment unless it is completed. Students choose from each experience what they consider to be relevant; and for the summative assessment they will submit a piece of written work (approx 1,500 words):

- title: A reflective account of the process of compiling my portfolio, plus aspects of my experience I consider most relevant to my future practice as a doctor. It will be graded A-F to reflect the range of work we experienced last year.

We may consider using a combination of self assessment and peer-assessment to counteract the effect of individual differences regarding the Competency Model. Peer assessment is known to improve accuracy of assessment in other areas of medicine (Cotton, Morrison 2004).
Conclusion

Mentors seemed to be the main agents that helped the students reflect. The ‘je ne se quoi’ quality of a teacher is recognised to be powerful in every field:

“student achievement gains are much more influenced by a student’s assigned teacher than by other factors like class size and composition.”

(Norman 2003)

Reflective practice requires a different mind-set from a standard scientific approach. It is now apparent that the original portfolio was set up with a mis-match of reflective process (which is open and fractal) and multiple, specific outcomes (closed and compartmentalised). Evaluation has been along the lines of ‘less of this and more of that’, but what is needed is something that is qualitatively different, rather than quantitative changes: the process IS the outcome.

We hope to develop tools that mirror the reflective process, so that the e-portfolio can be so much more than purely a transcription tool.

References


PS13
Mobility and Security: Key technology issues
Building a Digital Portfolio that Supports Informal Learning, Creativity and Mobility – a Design Science Viewpoint

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Abstract: As mobile devices and related network connections become cheaper and widely available, the use of the digital portfolios will likely change. The utilisation of these digital portfolios will take place in new settings. Novel artefacts with support of creativity, informal learning and idea processes will be built as a result of research. In this paper the authors will provide an example of one such artefact building process and the implementation of a mobile digital portfolio. The Design Science research framework will be introduced and a new evaluation focus will be suggested.

Keywords: mobility, informal learning, creativity, design science, portfolio, mobile learning

Background

The authors' interest in digital portfolios originates from experiences with mobile learning and usability research in Digital Learning (2004) and MOBlearn (2004) projects. In these projects informal learning, support for reflection, access and personalisation have been in the focus of the authors. One challenge that is emerging towards digital portfolios is the support for individual construction of meaning as Goodyear (2000) states "there may be good reasons for allowing and perhaps encouraging learners to create their own 'learnplaces', configuring the physical resources available to them in ways they find most comfortable, efficient, supportive, congenial and convivial". From the authors' perspective this notion about personal learnplaces points to informal and lifelong learning area. The latest portfolio research on Lifelong Learning Organisers by Vavoula (2004) is a good example of inspecting portfolios as learnplaces with high levels of interactivity and ownership. Because informal learning process is rather invisible and difficult to recognise (Livingstone, 2000), the authors have been occupied with certain questions: How can a researcher build an artefact supporting informal learning and simultaneously evaluate it? What kind of research framework is needed to study these kinds of new portfolios that integrate learning and knowledge building tools?

Objectives

Within this article the main objective is to describe a research framework that facilitates integrating a digital portfolio into long-term learning and creativity processes. The Design Science research framework (March & Smith 1995, Hevner et al. 2004, Järvinen 2004) is introduced and as a result of utilising this framework certain mobile portfolio accessibility elements are discussed in the summary chapter.

A case is also introduced. One of the author’s (Ahonen) ongoing Information Systems Science PhD research is about building a portfolio artefact that integrates human resource development, learning and creativity processes. Further, the intension is to support employees' long-term planning and utilisation of creative ideas within informal, work-based learning framework. This work is later in the text referred as 'PhD research case'.

The creation of the new artefacts and innovations as a part of the research is seen here as a reason for the Design Science research framework selection. In the next chapter this framework is described with PhD research case examples.
Design Science Research Framework

Design research is not defined by its methods but by the goals of those who pursue it (Bereiter 2002). Design research is called within the Information Systems research as Design Science (Hevner et al. 2004, March and Smith 1995). The research objectives of Information Systems necessitate a multi-methodological approach that integrates theory building, systems development, observation, and experimentation (Nunamaker, Chen & Purdin, 1991, 92). Design Science has its roots in engineering and the sciences of the artificial. It seeks to create an innovation that defines the ideas, practices, technical capabilities and products through which the analysis, design, implementation, management, and use of information systems can be effectively and efficiently accomplished. Whereas natural science tries to understand reality, Design Science attempts to create things that serve human purposes. It is technology-oriented. Its products are assessed against criteria of value and utility. (March & Smith, 1995) In the PhD research case the utility measurement of portfolios is the main focus. Additionally, the reason for Design Science research framework selection is the creation of a totally new artefact as a result of research.

Within the educational research terms like development research, design-based research and design experiments are used of Design Science (see e.g. Collins 1999, Reeves 2000). Design experiments in contrast to psychological ones attempt to carry experimentation into real-life settings in order to find out what works in practice (Collins 1999). Baumgartner et al. (2003) point out that “design-based research can help create and extend knowledge about developing, enacting, and sustaining innovative learning environments.” Sustaining within the PhD research case means developing a real system for long-term use in companies and organisations alike. In that sense the concept ‘design experiment’ is misleading.

According to March and Smith (1995) Design Science consists of two basic activities, build and evaluate. Building is the process of constructing an artefact for specific purpose; evaluation is the process of determining how well the artefact performs. According to Hevner et al. (2004) relevance and rigor both guide building and evaluation phases. Rigor is achieved by appropriately applying existing foundations and methodologies. The environment defines the problem space in which reside the phenomena of interest. It is difficult to do research on digital portfolios in the laboratory settings without understanding the (mobile) environment where they are used. To the authors’ minds this means relevance. In the author’s PhD case the evaluation focus is Observational (Learning and Idea Process Support), Analytical (Mobile Client/Server Architecture analysis) and Descriptive (Providing informed argument from earlier portfolio research). In the chapter 5 some mobile digital portfolio -related analytical and descriptive evaluation elements from the PhD case research are further constructed.

A PhD research case within Design Science research framework

The starting point for this research was the interest in intersection of creativity, idea-processes and learning in organisational settings. The digital portfolios became to the focus of the research after thinking about presenting idea and interest profiles for the other members of the community. These communities (cases) in the author’s PhD work consist of a small company, a faculty and a multinational corporation. Because the workers or the members of these communities travel a lot, mobility becomes an important utility element. Additionally, support of creativity and idea processes is another utility element.

Creativity can be defined as the production of novel and useful ideas in any domain (Amabile, 1989). It is a function of three components: expertise, motivation and creative-thinking skills where expertise and creative thinking skills are individuals’ natural resources (Amabile, 1998). According to Amabile (1989) expertise as a part of creativity covers everything that a person knows. It is technical, procedural and intellectual knowledge. Creative-thinking skills determine the way people approach problems and motivation is seen as an internal or external passion to handle challenges.
When the picture above is inspected, portfolios and digital portfolios traditionally support expertise building and presentation. Creative-thinking skills can be taught to a certain extend and tools supporting these skills can be integrated to digital portfolios. The extrinsic motivation coming from outside a person can be supported with guidelines and instructions how to maintain a portfolio. However, the intrinsic motivation originates from the interests of a learner (user) and this area to the authors' minds is difficult to support with portfolios. Amabile (1989) states that intrinsic motivation, a person's internal desire to do something is more essential for creativity than the extrinsic one, and people will be most creative when their motivation comes out of their own interest, not by the external pressure.

It can be argued that the support of creativity can and should be implemented within such a digital portfolio system where the focus is on idea generation and idea processes, like in the PhD research case. However, in business environment originality of ideas is not enough. To be creative, an idea must also be appropriate – useful and actionable. It must somehow influence the way business gets done – by improving a product, for instance, or by opening up a new way to a process. (Amabile, 1998, 78) This notion has made the authors to focus on appropriate question sets and reflection support tools that could help the idea initiator explain the value of the idea for the whole community. The skill of telling others about the value of an idea is not an easy one and therefore a digital portfolio with assessing tools may help in this process. These creativity-thinking related skills can also be seen as one form of competence (see a recent overview of competences by Sydänmaanlakka 2003).

Digital and mobile portfolios: definitions and differences

A digital portfolio or ePortfolio is a collection of learner’s work that can include text, pictures, hyperlinks and different multimedia elements. It has a certain navigation structure, which makes it easy to the learner to show the contents of the portfolio. Initially the idea of the portfolio or digital portfolio is to simply look at the learner’s working and learning process rather than the final grade (Niguidula, 1993). The digital portfolio displays an exhibition of individual work: efforts, project and achievements in certain areas (Wiedmer, 1998). It can be defined as a collection of learner’s work that demonstrates achievement or improvement (Barrett, 1994).

Helen Barrett (2000) has examined the process of developing electronic portfolios for teaching. She has described the process of the portfolio development with the following phases: collection, selection, reflection, projection and presentation. Each of these phases contributes to teachers' professional development and students’ lifelong learning. From the authors' perspective especially in collection and reflection phases the mobile functionality could enhance the idea generation process in the PhD research case.

According to Wiedmer (1998) the positive effect of a portfolio use includes a stronger sense of learner’s personal responsibility for learning. The learner can also have a stronger motivation to achieve results and reach goals in the learning process. To the
authors’ mind this seem to indicate that digital portfolios need to be more than just static web-pages; being versatile information systems with dedicated tools supporting planning and reflection processes. The learner is able to document his/her performance over time, which helps to follow learner’s own personal growth through different multimedia clips (Wiedmer, 1998). Authors see that the use of multimedia clips in a mobile environment may not be realistic. Therefore, the functionalities and task models need to be different in PCs and mobile devices (Ahonen, Syvänen & Vainio, 2004). From this perspective adaptive and customisable systems research is relevant also with digital portfolios.

Implications of mobile learning and ubiquitous computing research results on digital portfolios

What can a mobile digital portfolio bring more to the learning process? Does it liberate the learner from time and place boundaries? According to Kainulainen et al. (2004) the learner can among other things access carry-on notes and read or compose them in an on-the-go mobile situation.

Sharples (2000) has depicted that mobile learning should be approached especially from the viewpoints of lifelong and informal learning instead of focusing on the mobility of the device. The following table visualises the links between lifelong learning and mobile technology.

<table>
<thead>
<tr>
<th>Lifelong Learning</th>
<th>New Mobile Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individualised</td>
<td>Personal</td>
</tr>
<tr>
<td>Learner centred</td>
<td>User centred</td>
</tr>
<tr>
<td>Situated</td>
<td>Mobile</td>
</tr>
<tr>
<td>Collaborative</td>
<td>Networked</td>
</tr>
<tr>
<td>Ubiquitous</td>
<td>Ubiquitous</td>
</tr>
<tr>
<td>Lifelong</td>
<td>Durable</td>
</tr>
</tbody>
</table>

Table 1. The match of new communications and information technology to lifelong learning (Sharples 2000)

When examining the idea of mobile digital portfolios through this above-mentioned comparison the challenging issues from the authors’ point of view are especially those of personal, ubiquitous and durable. The authors see that a mobile digital portfolio system supporting long-term formal and informal learning in different varying situations would be both technically and ethically difficult to construct. As an example, in the author’s PhD research case the creativity-supporting question sets and their answers (data) are sensitive and personal in nature. Furthermore, when these kinds of data are used in collaborative idea-facilitation process the conflict is possible, especially when the ownership gradually changes from the individual to the group. When thinking about durability, the mobile device itself can be lost or may be broken. In this case, what kind of back-up plan or data replication system should be in place? How long will the data be archived?

Hartnell-Young (2003) points out that digital portfolios should be seen as one way in which technology can support lifelong learning and the creation of innovations. Kainulainen et al. (2004) have developed a mobile digital portfolio extension with open problem solving and idea generation functionality. Their main mobile feature of the digital portfolio is to capture descriptions about students’ positive and negative feelings during the learning process. In the author’s PhD research case the portfolio functionality in the mobile (phone) user interface is restricted purposefully on taking notes and writing down ideas, while PC user interface is more versatile with more functionality.

Vavoula and Sharples (2002) introduce criteria for a lifelong learning organiser (LLO). Their criteria can be seen from the authors’ point of view as one sort of utility of usability criteria: 1) A LLO should be easily transferable between places: it should be
either implemented on a device that is easy to carry and use around, or it should be
designed so as to run on a single computer system and be accessed remotely, via
any system. 2) LLOs should be available and functional anytime, during any day of
the week. 3) LLOs should provide a smooth transition between learning topic areas
and support the user to construct meaningful, integrated knowledge. (Vavoula et al.,
2002) Furthermore, Vavoula (2004) has demonstrated this LLO criteria in connection
to organising learning from activities to episodes and finally to projects.

When focusing on the challenges of informal and lifelong learning, Livingstone (2000)
defines informal learning as the activities that happen outside the curricula and that
are aiming at understanding, knowledge building, and skills acquiring (Livingstone
2000). The recognition of informal learning is however difficult. Even more
challenging is the creation of an artefact or a system that supports informal learning.
As Livingstone (2000) points, researchers do have to engage in a probing process
precisely because most people do not recognise much of the informal learning they
do - until they have a chance to reflect on it. Livingstone (2000, 54) also sees: “Other
major challenges include recognising incidentally initiated learning, irregularly timed
learning, and the distinction between learning processes and learning outcomes”.
Incidentally initiated and irregularly timed requirements set demands for tools
supporting learning: these tools need to be available immediately when needed
(technically speaking: even offline) and delay (technically speaking: latency) is not
tolerated. Therefore, within the author’s PhD research case the client-server (mobile
java client with server database support) functionality and offline idea-based notes
taking possibility have been inspected closely.

Marsick and Watkins (1997) point out that informal learning can be planned, and
overall learning is enhanced by planning, either before the fact or in retrospect to
learn from past experience. The same topic is pointed out by Bell (1977), when he
encourages taking advantage of the career development process to build in planned
opportunities for informal learning on behalf of the employee. In the PhD research
case the focus is on this planning process and how technology can support it.

When thinking about the earlier Design Science utility viewpoint, the costs and time
saving needs also set certain requirements. Ratner et al. (2001) states: “Replication
is especially important in mobile environments, since disconnected or poorly
connected machines must rely primarily on local resources. The monetary costs of
communication when mobile, combined with the lower bandwidth, higher latency, and
reduced availability; effectively require that important data to be stored locally on the
mobile machine.”

To the authors of this paper the above-mentioned requirements are profound and set
high demands on the systems’ accessibility and availability. In addition, the
asynchronous communication (learner, peer, mentor) and collaborative knowledge
building tasks around these LLOs seem to require a second thought on interaction
design, especially in mobile environment.

Conclusion and recommendations

Utility is the evaluation focus in Design Science research. In educational research the
focus of evaluation has been mostly on learning results. Additionally, learning results
are rather multifaceted in the area of informal learning. It might be appropriate in a
digital portfolio research to ask learners about their intentions and their experienced
usefulness instead of just defining variables for learning assessment. The research of
mobile artefacts like digital portfolios is likely to reveal instantly these utility factors,
because users are experts in answering to questions like ‘Does it work?’ or ‘Is it an
improvement?’. When using Design Science research framework one contribution to
science and digital portfolios research are the design guidelines. In the case of digital
portfolios usage, the traditional evaluation focus may be insufficient with such
portfolios that focus on human resource development, idea processes or long-term
personal development. This may also mean that the concept ‘digital portfolio’ needs
to be revised and new concepts like ‘lifelong learning organiser’ are more appropriate
here. Like Amabile (1989) states in the context of creativity, evaluation does not have
to be negative to destroy creativity. Regardless if the evaluation is positive or
negative, as a result we may feel restricted. This has made the authors to look
deeper at creativity and collaborative screening processes as part of the digital portfolios.

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PS12 - ePortfolio assessment and certification


Securing Electronic Portfolios

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Abstract: As ePortfolios grow in popularity and importance, security will play a progressively larger role in their implementation and delivery. Protecting people’s personal data, restricting viewing to those authorized, and insuring the authenticity of artifacts are all issues that must be addressed before electronic portfolios can take a leading role in the online environment. We present a number of problems that face ePortfolios, as well as potential solutions and experience with some of the same.

Keywords: Security, Assessment, Artifacts, Confidentiality, and Privacy

Introduction

The rapid adoption of electronic portfolios and the proliferation of systems designed to assist in their creation creates a number of difficult problems with regards to ensuring the security and confidentiality of data in those systems. With traditional portfolios, security has not been a focus; data were kept private through local storage and non-distribution. The same initially occurred with simple document- or web-based portfolios, where content could be kept close.

With the advent and use of portfolio systems, where multiple users can keep their data in a single place for dissemination, this model no longer works. The use of a central system provides a tempting target for people looking to damage the portfolios of others, for whatever reason; the possible inclusion of assessment data means that such attacks are even more likely to occur. Consequently, security must become a concern to those building and implementing such systems.

In this paper we will discuss our view of the security issues facing ePortfolios and their continued adoption. We will also detail the security provisions taken in our own portfolio project, called SPARC – the Student Portfolio Architecture and Research Community (Bogyo 2004), as well as an overview of the security techniques employed in other current electronic portfolio projects, such as Chalk and Wire and the Open Source Portfolio Initiative.

Section 2 will present an overview of the current security problems facing ePortfolios. Section 3 will give a brief overview of the state-of-the-art in existing portfolio systems, while Section 4 outlines one solution we have taken in developing the SPARC ePortfolio platform. Section 5 will present future work, for both the SPARC system and portfolio systems in general, and Section 6 presents our conclusions.

Problems in ePortfolio Security

There are six main areas of security that must be addressed. These are: end-to-end security, confidentiality of interactions, confidentiality of assessments, security of published portfolios, security of portfolio transfers, and verification of artifact authenticity.

End-to-End Security

End-to-end security refers to security of the communication between servers and clients. In centralized portfolio systems, these generally include three parts: client, web server, and database server.

Security between client and web server is a problem that is far larger than the portfolio community, and is one that has been studied for years (Frier et al. 1996, Dierks et al. 1996).

The database server is a different problem. Many existing database servers have little or no built-in capability for encryption of their communications. Other systems have either only recently acquired the capability, (Microsoft 2004) while some
required an additional package to enable it (Oracle 2004). There are also two different methods of having the server communicate with the program; either centrally through the web server, or to the clients themselves. Direct communication with the clients means we have hundreds or possibly thousands of simultaneous connections that must be encrypted or secured, while communication with the web server would allow aggregation of these communications into a far fewer number of streams.

End-to-end security also includes security at the end-points of the communication channel. At those three endpoints, again, we have to be concerned about storage of the data passed between systems, regardless of whether the methods of passing the data were secure or not.

When creating a web-based system, we cannot guarantee anything about the browser that individuals may use to access the system. The variety of web-browsers and versions in current use mean that there is no way to test every potential browser for compliance with a system’s security. To make matters worse, the proliferation of spyware, virii, and other programs that may attach themselves to browsers to steal data means we likely cannot trust them at all. As well, browsers largely store data between sessions in an unencrypted format.

Web servers are also vulnerable in their own way. While they are far less likely to be attacked via virii and similar methods, they are sometimes shared with active users, and may be vulnerable to information leaks, or hackers getting access to temporary files. Good systems administration techniques will drastically lower the possibility of these problems occurring, as well as the fact that very little, if any, data are stored between sessions.

Database servers are likely the single largest potential spot of vulnerability in the system. They attract the greatest amount of attention, for a number of reasons: they concentrate hundreds or thousands of users’ data in a single place; people may be looking to harvest data, such as email addresses, assessment information, names, or other information; learners may be looking to alter assessment information for themselves or others; as well, database administrators should not have access to the assessment information, which is a notion that is not easily adhered to in the traditional world of database administration.

**Confidentiality of Interactions**

Interactions are a generic way to refer to any conversations, comments, or other communication between users of a portfolio system. These could include student/teacher (or tutor/tutored, mentor/mentored, etc.) conversations, peer feedback, responses in regards to a job application, or any other number of possibilities.

Interactions have a fairly simple set of requirements. First, they should be completely private to the two parties involved in the interaction. No one else should be able to view them. Second, it should be possible to verify that a certain interaction (whether in whole or in part) originated with a certain account; if we have peer feedback, for example, we should be able to say for sure that this particular comment came from this account. (The possibility for social engineering attacks exists here, as it is difficult to deal with those in a system where the primary requirements include user-friendliness.)

Less importantly, it may be desirable to allow these interactions to become public based on the consent of both individuals. It has been stated that one of the great possibilities of electronic portfolios is to show improvement in the portfolio (and, indirectly, the subject of the portfolio) over time. With the possibility of including verifiable third-party feedback into the portfolio, this would be a great leap forward towards this goal.

**Confidentiality of Assessment**

Though interactions are the most generic form of communication between students and teachers, dealing with the issue of assessments is more complicated. While most of the requirements that apply to interactions apply to assessment as well,
some of them change slightly. For example, assessments should not be made public – nor should the option be available – in the same way that it would be desirable to allow interactions to be.

In addition to both instructor and student having access to assessment information, it is often required that at least a third person have access to the marking information. In university scenarios, there is often one instructor responsible for a course and the assessments for that course, while there are a number of teaching assistants that perform the actual assessment functions. In a case such as this, we need to make the assessment information available to a minimum of three people – the student, the TA who did the assessment, and the teacher responsible for the class.

Again, any assessment needs to be digitally signed such that it can be immediately verified that the marks came from an authentic source. We must plan for the possibility that marks may be added to or altered in the database by a malicious individual, and be able to detect when and if this occurs.

Security of Published Portfolios

A single individual may have multiple different published versions of their portfolio, something that most current portfolio systems allow for. Making sure that these published portfolios remain secure means that only the intended audiences are allowed to access published versions or portions thereof.

Different uses for portfolios include job searching, assessment requirements, and personal portfolios for friends and family. Crossover has the potential to be very damaging. An internal company portfolio for evaluation purposes (i.e. a year-end review) might contain commercial secrets; if there is another portfolio used for job searching and some of the secret information became available, it could harm the subject’s employer as well as the subject.

Audiences can be individuals, groups, or groups of groups and individuals. Accommodating these possibilities is not the simplest of tasks, and must be carefully considered.

Security of Portfolio Transfers

While the ideal of a single portfolio for life is a laudable one, in the current incarnation of portfolio systems, it is unlikely that a portfolio would survive within a single system for its entire lifetime. Current systems tend to be installed at the institutional level, whether that is a corporate, university, or school district level. When people change circumstances in their lives – move from secondary school to university, for example, or from university to a corporate environment - the portfolio will likely have to follow them. Currently, groups are developing standards to allow for this packaging and transfer (IMS 2004).

Securing the transfer of these portfolio transfers between systems is important, as many of the problems that exist for end-to-end client/server security exist for transferring portfolios between systems. Interception of the portfolio, altering the portfolio in transit, and leaking of sensitive information are all possibilities.

For indirect transfers between systems – when the portfolio contents sit in the hands of either the subject or someone else for a period of time – the risks are even greater. In this case the subject may have a good deal of time to alter portions of the portfolio. While much of the time we may not care if portions of the portfolio are altered – the contents of the portfolio are writing and artifacts – in some cases we will, specifically with regards to assessments or interactions attached to the portfolio.

Verification of Artifact Authenticity

Possibly the most difficult problem to solve in this set is that of verifying artifact authenticity. As ePortfolios become more prevalent, attaching documents or other artifacts generated by other computer based systems, such as a university student information system, will become more common. When applying for a job or further education, it may be beneficial to be able to automatically determine if an artifact is
authentic. In most cases this is impossible, or at the very least impractical; we cannot, for instance, determine whether a portfolio owner did, in fact, create the object depicted in a photograph attached to their portfolio. With system-generated items, however, we can, but there are a number of obstacles to overcome. Did the right authority sign the artifact? Has the artifact been tampered with?

One example would be the university transcript. Off-line methods of verifying that a transcript originated in the proper place may not work in the online world, so we need different methods of verification. We also need ways to ensure that the document has not been tampered with in any way.

**Overview of Existing Solutions**

*End-to-End Security*

The issue of securing communications between two nodes has been tackled before, and often in the web environment. The Secure Sockets Layer protocol for stream encryption (Frier 1996) and its successor, Transport Layer Security (Dierks 1999) are both widely recognized and implemented in web browsers and servers. They allow for on-the-fly encryption of data being transferred with relatively low overhead on either side, while still being secure. While these protocols admittedly have their own set of problems (Seifreid 2001), in the vast majority of cases they allow for secure communications between a web server and its clients.

The case of communication with a database server is more difficult, however. Many database servers on the market support SSL at both the client and server sides, either inherently or with an add-on package. However, some still lack the support, especially older versions that organizations may still be using for their primary database systems.

Encrypting the communications stream leaves open the possibility of problems at either the client or the server end, as stated above. At the client side, the best solution is to minimize the amount of data stored. This can usually be accomplished by using an expiring cookie representing the session ID, and storing the data on the web server side connected to the session ID. By keeping the data with the web server, we make it possible to secure the data using good systems administration techniques discussed elsewhere.

*Confidentiality of Interactions and Assessments*

While most existing portfolio systems maintain confidentiality in the interface – that is, simply by only selecting from the database those interactions and assessment pertinent to the current subject – there is no way to keep interactions secure outside of the interface.

*Security of Published Portfolios*

Most existing electronic portfolio systems implement some sort of basic protection for the published portfolios, whether it is a simple public/private mechanism, or a more complex username- and password-based system of authentication.

Some systems allow for either internal (via their regular login) or external (via a combination of email address and either a subject-entered or generated password) users, or a combination thereof, to view the portfolio (OSPI 2004). While this allows for flexibility, it introduces several more problems. Consider a human resources officer at a firm looking at application from several individuals at a university, all with portfolios. The individuals give the HR officer access to view the portfolios, and there are two possible scenarios; the first, that each individual gives the officer a different password; or the applying individuals must create a common password, which requires cooperation. Both of these have their downsides – maintenance of the passwords in the first case, while in the second case subjects letting others know who will be viewing their portfolio, negating any gains from the introduction of security.
Security of Portfolio Transfers and Verification of Artifact Authenticity

As there is no portfolio system that currently implements either one of these features, there is no standard in securing them. As well, there are no systems with the ability to differentiate in any way a system-generated artifact from a user-generated one, a necessary precursor to being able to verify artifacts in any form.

SPARC and Security

The SPARC ePortfolio project has as one of its primary goals the investigation of security enhancements to the traditional portfolio system. As such, we have begun work on a framework to solve some of the issues presented above.

Our team has created a usable tool that provides the portfolio creator with a simple way of creating and maintaining a digital portfolio. Instructors can also use the tool to track portfolio creation of individuals and provide feedback and direction in an online environment. Researchers can currently extract data on usage and content with permission given by the portfolio creator. The underlying structure of the tool is usable for different purposes, currently focusing on the Province of British Columbia's Ministry of Education's graduation portfolio requirements, (BCEd 2004) as well as Simon Fraser University’s Faculty of Applied Science's foundational year TechOne portfolio.

Throughout the evolution of the project, security has been a primary concern.

Overview

The initial problem we have chosen to attempt to solve is that of confidentiality of interactions and assessment. Our solution involves the application of the public key infrastructure (PKI) to in-database storage. Choosing this solution has allowed us to utilize low-cost database systems – bypassing the need for expensive database add-ons – while still allowing for solutions to typical problems such as lost passwords.

Assumptions

There are three primary assumptions we have made in designing our system. The first is that the database administrator shall not be trusted to view the data. In many potential applications of the software, the database may be hosted not by the users of the system, but by an outside company; one example may be a school district hosting the system with an application service provider. In other cases there may not be a full-time database administrator, only a contractor. In all of these cases it may cause a breach of privacy or confidence to allow any data to be seen by the DBA.

The second assumption is that the system must be as simple as possible for users to operate. In our system all the user needs to remember is their username and password, data that would be required regardless of whether there was encryption or security behind it. In all likelihood there will still be users that lose their password (though integration with an overall sign-on system makes this less likely), and data will need to be recovered. We have factored this in, as well.

The final assumption is that the database, given the relative density of important information stored there, as well as the ability to alter it, will, at some point, come under attack. Part of the assumption that the DBA cannot be trusted comes from backdoors or default initial passwords (Rafail 2000) that have been found in some enterprise database systems. By exploiting these issues, an attacker may be able to gain administrator-level access to the data, allowing the insertion, alteration and deletion of data.

The Public Key Infrastructure and its Application

Public Key Infrastructure refers to a system that has two particular properties (Rivest et al. 1978). The first of these is that a complete key consists of two parts. The first, or public, key is used for encrypting data. The second, or private, key is used for...
decrypting the data encrypted with the public key. The public key can be freely distributed to anyone wishing to encrypt data for a particular recipient, while the private key is kept secure by the recipient to decrypt the data sent. Without the private key, decrypting the data is effectively impossible — save access to massive amounts of computing power — and the method of encryption is therefore secure.

The second property is that trust can be encoded in chains, such that we can determine whether we should trust someone based on whether they are trusted by someone we believe (Schneier 1996). For example, a company A can sign the key for company B, saying that they trust them to be who they say they are. If we, in turn, trust company A, then we can believe company B to be who they say they are, and we can conduct business.

The application of the public/private key distinction to this area is obvious. Anyone can encrypt data to anyone (or any number of other people), meaning this method will work for feedback or other interactions, or assessments (as the same data can be encrypted for 3 people or even more). However, only the intended recipient can decrypt the data, assuming that the private key is kept secure.

Trust chains are used in a more subtle way in this scheme. Our use of trust chains is intended to avoid the problem of an attacker injecting a new key into the database. By having a trusted certificate signer, we can assure ourselves that all legitimate keys will be signed. If we find a piece of data signed by a non-legitimate key, or data signed by a valid, legitimate key but on the wrong type of data — interactions instead of assessment, for example — we can automatically raise a flag on the data, and alert both the user and administrator of the system that there are bad data present.

4.4 Symmetric Encryption and its Application

Symmetric encryption is effectively the opposite of public key encryption: a single key that functions as both the encryption and decryption key, and hence must be kept secure at all times (Schneier). Symmetric encryption is most useful for keeping information secure within a certain group that shares the key, or to a single person.

In our case, the assumption that the private key remains secure is a flawed one unless we make some enhancements to the system. Traditional methods of keeping private keys secure include carrying the key on a secure device — which is not feasible in this situation, for as a web-based system we cannot guarantee that a system a user logs on from will have any non-standard hardware, and additionally it
violates our assumption of minimal intrusion on the user – or keeping it in a secure area of a computer. As we are keeping keys in the database, this last method will not work – should an attacker gain root or application level access to the database they will have access to the keys.

Again, we would also like to minimize mental load on the user. Hence, we use their password as the symmetric encryption key, and encrypt the private key in the database itself. In this manner, the key itself is safe. And we impose no additional requirements on the user; in fact, they never realize the decryption/encryption is taking place.

In addition to protecting private keys, symmetric encryption is used to encrypt the actual information contained within the interaction. The symmetric key used for this is a randomly generated string, which is in turn encoded with the public keys of those users that require access to the information from the interaction (see Figure 1). The symmetric key is only stored in this encrypted version.

When accessing the interaction information, the system must first decrypt the user’s private key with their password, then the individual interaction key, then the data itself. This is all performed server-side, so computationally fast client machines are not required. As well, to speed the process up, either the decrypted private key or the interaction keys may be stored server side for the duration of the portfolio session.

There is one additional encryption performed when encrypting the interaction keys and private keys. Each install of the system has a master public and private key, against which all private keys in the system are encrypted. This private key is then encrypted with a password, and the password given to the person in charge of the system. Ideally, this won’t be the database administrator, but rather an administrative individual, perhaps a faculty member in charge of the system, or another information technology professional. The reason for this master key is in case individuals forget their passwords; whereas without the master this would be catastrophic (they would effectively lose all their data in the system), with the master, replacement of the key is a relatively straightforward and painless process, as we can access (via the master) and re-encrypt (with the new private key) all the data again. Note again, however, that integrating the SPARC software within a large sign-on system, such as a campus-wide university login system, can decrease the probability of this occurring. For example, at Simon Fraser University, we have connected SPARC to the University’s centralized account management, so the account students, staff and faculty use to login to the library, workstations, labs, or their LMS are all consistent.

4.5 Design Issues

There are two major issues that still exist with this database design, however. The first is the social engineering aspect, which, unfortunately, is a problem systemic to most security schemes. Nearly all schemes require some mental load on the user. A malicious user can, in turn, exploit this. There will nearly always be at least one user of a system vulnerable to this sort of attack, and avoiding the possibility of the attack is very difficult.

The other difficulty lies in the database itself. Should an attacker gain administrator-level access to the database, they would be able to update or delete information contained within it. While we can detect the alteration, recovering from it must be done at the database level, rather than the application level. In turn, this requires a well-setup database with rollback points, making it possible to recover from failure.

Future Work

There are a number of enhancements currently being planned for the SPARC system. For a full treatment, please see (Fee 2004). Security is a major research topic, with several immediate pathways being researched.

Enhancements

The first goal for the SPARC system is to enhance the security system already in place. This includes moving more of the cryptography functionality into the database,
rather than performing the function in the application in order to speed up encryption and decryption operations.

**Security of Published Portfolios**

We wish to take the current system of username/password authentication being used in most other systems and enhance it, by allowing external authentication mechanisms.

Specifically, the plan is to utilize trusted authentication sources – for example, another university’s sign-on system – in order to facilitate single-sign-on across portfolio platforms. A full scenario would look like this: the creator of the portfolio determines they wish a certain individual or group to have access to a published portfolio. The creator searches the organization (from within the portfolio system) in order to find the correct individual(s), and gives them access. The system then notifies those individuals via email, who may then login to the portfolio system using the username and password for their organization. Once their organization assures the SPARC system that they are who they say they are, the software will grant them permission to view the portfolio.

This system will be built on top of the Shibboleth framework for distributed authentication, though it may require significant enhancements to the underlying libraries to accomplish this (Shibboleth 2002).

**Security of Portfolio Transfers**

Transferring a portfolio between systems is another goal of the SPARC project, allowing for movement of an individual’s portfolio between companies, schools, or any other level of implementation. Once this is complete, we must guarantee the security of these transfers.

**Conclusions**

While there are many issues related to ePortfolios and security, including many places where the current state of the art needs to be improved, good progress is being made.

More attention is being paid to utilizing encryption wrappers for communication between clients and servers, and less attention is being paid to those points being made vulnerable by this switch, namely, the server systems.

The SPARC system is currently attacking the problem of security from several different angles, including securing the data inside of the database itself, and making dispersal of rights on published portfolios more simplistic and easy to manage.

**Acknowledgements**

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**References**


PS12 - ePortfolio assessment and certification


Eportfolio : durée de vie et sécurité

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Abstract: This paper selects a definition of eportfolio among those used in the literature, then some propositions relevant to the ‘life’ of eportfolio are proposed: one for each year, one for each level and one following the student during his school time. Some strategies of storing eportfolio are also according to each type. Finally the problem of accessibility is discussed to decide who cam manipulate an eportfolio, when and how.

Résumé : Dans ce papier nous choisissons une définition du concept de eportfolio parmi celles offertes dans la littérature puis nous proposons des catégories de eportfolio selon sa durée de vie : par an, par niveau d’étude ou un portfolio qui suit l’apprenant durant toute sa scolarité. Suite à quoi certaines stratégies de stockage du eportfolio sont proposées ainsi qu’une discussion de privilèges sur les eportfolio : qui a accès à un eportfolio, la spécification des droits d’accès en fonction du profil et de la période.

Mots clefs: Eportfolio, durée de vie, sécurité, accès, actif, passif

Introduction

Le concept portfolio, et précisément de eportfolio, se répand de plus en plus. Il est vrai que l’usage de cet outil est presque absent en Afrique, et surtout en le comparant au cas européen et notamment en France où il gagne du terrain même s’il reste limité en comparant au cas américain et essentiellement canadien [1]. Toutefois et indépendamment de sa fréquence d’usage certaines questions sont à se poser et ce relativement à la catégorie du portfolio et à la sécurité dans son utilisation et donc à la validité des informations qu’il présente.

Nous proposons de traiter l’ensemble de ces questions dans ce papier et ce en adoptant une définition du portfolio puis en recensant ses différents types pour aborder la durée de vie d’un portfolio et sa sécurité.

Définition et typologie

Définition

Plusieurs définitions peuvent être présentées pour le concept de eportfolio toutefois nous en retenons deux à savoir la plus générale [2] « Collection d’œuvres propres à refléter le talent de son auteur » et la plus concrète « Collection des travaux d’un élève qui fait foi de sa compétence montrant des traces pertinentes de ses réalisations » [3].

La dernière définition contient des mots clefs qui ont été à la base de nos questions à savoir les termes ‘foi’ et ‘réalisations’.

Typologie

Plusieurs typologies peuvent aussi être recensées où certaines distinguent huit types de portfolio [4], d’autres en distinguent quatre [2] ou encore trois types et c’est cette dernière que nous retenons. En effet l’Association For Supervision And Curriculum Development [2] distingue trois types de portfolio :

le portfolio d’apprentissage : aussi nommé dossier d’apprentissage car il montre la progression de l’élève dans l’apprentissage puisqu’il contient des travaux (complets ou non) qu’il a réalisés. Dans ce dossier l’apprenant sélectionne, généralement avec son instituteur, ses groupes de travaux en fonction des compétences proposées tout au long de son parcours en tant qu’apprenant.

le portfolio de présentation : aussi nommé dossier de communication car il contient les productions que l’apprenant souhaite conserver tout en présentant son avis dessus. La sélection des travaux doit aussi être liées aux compétences à acquérir.
Durée de vie d’un portfolio

Il est certain que l’intérêt d’un portfolio dans le milieu de l’enseignement est presque admis par l’ensemble de la communauté toutefois le débat porte sur sa durée de vie et la question qui peut être posée est :

Un portfolio par niveau ou un portfolio pour la vie ou le cas extrême un portfolio par année d’étude ?

Il est vrai que chaque solution a ses avantages et ses inconvénients aussi bien pour l’apprenant que pour l’enseignant.

Il nous semble nécessaire de préciser le sens que nous donnons au terme niveau. Nous entendons par niveau la maternelle, l’école primaire, le collège, le lycée, le premier cycle de l’université, le second cycle, le troisième cycle. L’apprenant aura donc autant de eportfolio que de niveaux par lesquels il passe.

Signalons aussi que la distinction entre les trois catégories de eportfolio (par an, par niveau, à vie) est liée à l’aspect conceptuel et concerne essentiellement l’accessibilité. Ainsi un eportfolio par année implique implicitement que l’enseignant n’a d’accès qu’à celui de l’année scolaire (ou universitaire) en cours. Un eportfolio par niveau regroupe les informations relatives à chaque année appartenant au niveau en cours. Les contenus des eportfolio des niveaux précédents ne sont pas accessibles (consultables) aux enseignants actuels, contrairement à celui qui est pour toute une vie où toutes les informations des années précédentes sont accessibles (consultables) en plus de celles de l’année en cours.


Remarquons que ce qu’on entend par ‘faible’ c’est l’apprenant qui a une bonne volonté mais à capacité (intellectuelle) limitée et avec lequel un effort supplémentaire pourra au maximum le rapprocher vers la catégorie des moyens.

Le ‘mauvais’ est celui qui ne peut être jugé tant il est perturbateur ou créateur de problèmes au cours des enseignements.

Le ‘moyen’ est celui qui a besoin d’une petite aide pour passer à la catégorie des ‘bon’ et ne pourra y rester sans cette aide.

Le ‘bon’ est celui qui doit juste faire un petit effort pour passer à la catégorie ‘excellent’.

Avantages et Inconvénients par durée de vie

On ne peut parler de points positifs et négatifs de eportfolio en absolu mais relativement à ses différents intervenants. Les principaux intervenants sont l’apprenant (enfants, élève, étudiant) et l’enseignant (éducateur de maternelle, instituteur, enseignant du collège ou du secondaire, enseignant universitaire). Nous allons donc étudier les avantages et inconvénients pour chaque cas de durée de vie d’un eportfolio et ce en fonction des intervenants.

Premier cas : un portfolio par année d’étude

Dans le tableau suivant nous présentons les avantages et inconvénients pour l’apprenant selon sa catégorie :

<table>
<thead>
<tr>
<th>Catégorie de l’apprenant</th>
<th>Avantages</th>
<th>Inconvénients</th>
</tr>
</thead>
</table>

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Faible  
Il commence chaque année sur le même pieds d’égalité que ses collègues sans que ses enseignants aient des ‘à priori’ le concernant. Tant que ses aptitudes ne sont pas découvertes il peut être considéré parmi les ‘bons’ par l’enseignant jusqu’à preuve du contraire.

ignorant ses spécificités, il peut être brusqué par l’enseignant et donc bloqué tout au long de l’année. Peut avoir des lacunes relativement aux premiers chapitres tant que l’enseignant ne lui a pas accordé d’encadrement particulier.

mauvais  
Il a une chance d’être traité comme ses camarades surtout s’il est devenu plus ‘mûr’ à la nouvelle année.

S’il a eu de bons résultats ou de bonnes notes dans les années précédentes, l’enseignant n’a pas l’occasion de les voir pour être plus tolérant sur son cas.

Moyen  
Les mêmes que pour le faible

Les mêmes que pour le mauvais

bon, excellent  
-  
Le début est délicat car habitué à un traitement plus ou moins privilégié l’an précédent il doit encore une fois faire ses preuves dès le début.

Dans le tableau suivant nous présentons les avantages et inconvénients pour l’enseignant selon la catégorie de l’apprenant:

<table>
<thead>
<tr>
<th>Catégorie de l’apprenant</th>
<th>Avantages</th>
<th>Inconvénients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faible</td>
<td>Risque de n’accorder l’encadrement rapproché que tardivement</td>
<td></td>
</tr>
<tr>
<td>mauvais</td>
<td>Perdre du temps pour découvrir les éléments perturbateurs</td>
<td></td>
</tr>
<tr>
<td>Moyen</td>
<td>Même chose que pour le faible</td>
<td></td>
</tr>
<tr>
<td>bon, excellent</td>
<td>Risque de les stimuler tardivement</td>
<td></td>
</tr>
</tbody>
</table>

**Deuxième cas : un portfolio par niveau d’étude**

Dans le tableau suivant nous présentons les avantages et inconvénients pour l’apprenant selon sa catégorie :

<table>
<thead>
<tr>
<th>Catégorie de l’apprenant</th>
<th>Avantages</th>
<th>Inconvénients</th>
</tr>
</thead>
<tbody>
<tr>
<td>faible</td>
<td>En changeant de niveau il pourra bénéficier d’une période dans laquelle il échappe à son label de ‘faible’, mais bénéficier d’un encadrement rapproché dès le début</td>
<td>il ne pourra pas bénéficier de la courte période d’appartenance aux ‘bon’ au début d’une année d’étude, il est ‘labeled’ dès le début tant qu’il est au même niveau</td>
</tr>
<tr>
<td>mauvais</td>
<td>Pourra commencer une page blanche quand il change de niveau</td>
<td>Son étiquette le suivra tant qu’il est au même niveau</td>
</tr>
<tr>
<td>moyen</td>
<td>Augmentera ses chances de passer à la catégorie ‘bon’ puisqu’on ignore son passé quand il change de niveau. Bénéficiera d’un encadrement spécifique dès le début</td>
<td>Son passé étant connu on risque de ne pas le stimuler suffisamment tant qu’il est au même niveau</td>
</tr>
</tbody>
</table>
Dans le tableau suivant nous présentons les avantages et inconvénients pour l’enseignant selon la catégorie de l’apprenant :

<table>
<thead>
<tr>
<th>Catégorie de l’apprenant</th>
<th>Avantages</th>
<th>Inconvénients</th>
</tr>
</thead>
<tbody>
<tr>
<td>bon, excellent</td>
<td>Tant qu’il est au même niveau il n’a pas à faire ses preuves dès le début de la rentrée mais doit travailler pour rester au même niveau</td>
<td>Sera jugé ‘sévèrement’ en cas d’erreur ou encore on ne lui tolère pas les chutes de performances. Etant habitué à un certain traitement de faveur, un changement de comportement des enseignants peut le fragiliser surtout en changeant de niveau</td>
</tr>
</tbody>
</table>

**Troisième cas : un portfolio pour la vie**

Dans le tableau suivant nous présentons les avantages et inconvénients pour l’apprenant selon sa catégorie :

<table>
<thead>
<tr>
<th>Catégorie de l’apprenant</th>
<th>Avantages</th>
<th>Inconvénients</th>
</tr>
</thead>
<tbody>
<tr>
<td>faible</td>
<td>Accorde l’encadrement rapproché dès le début</td>
<td>Son label de ‘faible’ le suivra partout</td>
</tr>
<tr>
<td>mauvais</td>
<td>Ajuste sa pédagogie lors du traitement des éléments perturbateurs pour en tirer le maximum</td>
<td>Son label le suivra partout</td>
</tr>
<tr>
<td>moyen</td>
<td>Accorde un traitement stimulateur pour l’encourager</td>
<td>Son passé étant connu on ne peut pas le stimuler suffisamment pour faire mieux si il ne s’est pas amélioré au cours des années</td>
</tr>
<tr>
<td>bon, excellent</td>
<td>Faire en sorte qu’il garde le même niveau sinon l’améliorer</td>
<td>Risque d’être jugé sévèrement en cas d’erreur.</td>
</tr>
</tbody>
</table>

Dans le tableau suivant nous présentons les avantages et inconvénients pour l’enseignant selon la catégorie de l’apprenant:
<table>
<thead>
<tr>
<th>Catégorie de l'apprenant</th>
<th>Avantages</th>
<th>Inconvénients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faible</td>
<td>Accorde l'encadrement rapproché dès le début</td>
<td></td>
</tr>
<tr>
<td>mauvais</td>
<td>Ajuste sa pédagogie lors du traitement des éléments perturbateurs pour en tirer le maximum</td>
<td></td>
</tr>
<tr>
<td>Moyen</td>
<td>Accorde un traitement stimulateur pour l'encourager</td>
<td></td>
</tr>
<tr>
<td>bon, excellent</td>
<td>Faire en sorte qu'il garde le même niveau sinon l'améliorer.</td>
<td></td>
</tr>
</tbody>
</table>

Cette classification indique qu'un eportfolio à vie est le cas idéal pour l'enseignant puisqu'il peut avoir une vue globale des profils de tous ses apprenants et ajuster sa pédagogie en fonction de cela. Toutefois la consultation des eportfolio à vie pour tous ses apprenants représente certainement un travail fastidieux.

Ce type de portfolio semble aussi être l'idéal pour les apprenants ayant un bon niveau, même s'il risque parfois d'être pénalisant pour les autres. En effet on peut penser qu'un apprenant ayant un niveau faible, perturbateur ou moyen a besoin d'avoir une chance pour se racheter. Si ce eportfolio est bien exploité par l'enseignant, il offrira certainement à cette catégorie d'apprenant d'améliorer leur ‘label’.

La gestion du stockage et des accès à un eportfolio

Les catégories de eportfolio citées précédemment touchent essentiellement au niveau conceptuel car on peut considérer que le niveau physique est schématiquement le même indépendamment de la catégorie.

En effet on peut schématiser un eportfolio par deux espaces :

un espace dynamique qui contient toujours un élément unique correspondant à l'eportfolio de l'année en cours sur lequel l’apprenant et ses enseignants apportent des mises à jour.

un espace statique relatif aux eportfolio des années précédentes qui peut comprendre zéro ou plusieurs éléments et ce en fonction de la catégorie du eportfolio autrement dit de la stratégie de sauvegarde adoptée.

Deux types de gestion apparaissent alors :

la gestion du stockage des eportfolio

la gestion des accès aux eportfolio

Gestion du stockage des eportfolio

La gestion d’un eportfolio dépend de la nature de ses données et plus précisément du degré stratégique de l’information qu’il contient.

En effet les données de la maternelle ne sont pas aussi stratégiques que celles des autres années d'études. Une solution simple peut consister à laisser leur gestion et stockage au niveau des ordinateurs personnels de la maternelle, à la fin de chaque trimestre ou de l’année l’éducatrice peut sauvegarder les eportfolio de chaque apprenant sur un CD pour alléger les disques de leur PC.

L'idéal serait bien sur que la maternelle soit contractée à un fournisseur d'accès à internet (FSI) et que ces eportfolio soient accessibles à distance pour les parents.

Lorsque l'apprenant avance dans son parcours de quête du savoir ses données deviennent plus stratégiques et ce à partir de l’école primaire. D'autre part un eportfolio est amené à être manipulé par plusieurs personnes géographiquement éloignées tel que l’enseignant pour y présenter ses appréciations à partir de chez lui.

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par exemple, l’apprenant pour y déposer ses travaux et aussi les parents pour contrôler l’avancement de leur enfant.

Aussi, et indépendamment de la catégorie du eportfolio (par an, par niveau ou à vie), les données doivent-elles être hébergées sur le serveur de l’établissement d’enseignement ou chez un FSI et éviter les hébergements gratuits qui diminuent la crédibilité du contenu.

Aussi est-il utile de signaler deux niveaux de problèmes à savoir :

où héberger le eportfolio actif (celui de l’année en cours)

où héberger les eportfolio passifs correspondant à ceux des années précédentes et ce indépendamment de la catégorie choisie (par an, par niveau ou à vie).

Pour traiter le dernier point cité nous allons étudier chaque cas de eportfolio à part :

Cas du eportfolio par année d’étude : cela revient à ne donner accès qu’à l’eportfolio actuellement actif, toutefois il faut penser à archiver à chaque fois celui de l’an précédent.

Cas du eportfolio par niveau d’étude : la différence avec le cas précédent est que les eportfolio des deux ou trois années précédentes doivent être accessibles en lecture seulement. Ce sont donc des liens à spécifier une fois la politique de l’hébergement précisée. Les eportfolio précédents étant normalement déjà archivés.

Cas du eportfolio à vie, la différence avec le cas par niveau est que le nombre de liens à spécifier est plus grand car il faut avoir une adresse pour chaque année d’étude. Les accès à ces liens sont uniquement en lecture

Cela peut être schématiquement résumé dans le fait que pour chaque apprenant on gère une sorte de ‘page d’accueil’ qui offre un lien vers le eportfolio en cours et, selon le cas, un, deux ou trois liens pour les années précédentes du niveau en cours ou simplement plusieurs liens pour chaque année passée.

Le problème revient donc à choisir une solution pour l’hébergement aussi bien du eportfolio actif que ceux qui sont passifs.

Il est vrai que les solutions qui peuvent être proposées dépendent étroitement de la stratégie de gestion d’internet au niveau des établissements d’enseignement.

Une première solution peut consister à proposer que le eportfolio actif (celui de l'année en cours) soit hébergé chez l'institution où l’apprenant poursuit ses études. L'hébergement de la ‘page d’accueil’ de chaque apprenant ainsi que ses eportfolio précédents peut par exemple être assuré par le rectorat auquel est rattaché l'institution en question ou à la direction territoriale ou à la limite chez un FSI conventionné avec le ministère de tutelle. Ainsi, et à chaque fin d’année scolaire (ou universitaire) l’institution en question libère son espace de stockage en transférant le eportfolio actuel pour qu’il soit ajouté à la ‘page d’accueil’ et devenir un eportfolio passif à son tour.

La critique de cette solution peut porter sur deux inconvénients à savoir l’implication de l’institution d’enseignement dans la gestion du eportfolio actif, et la grande masse d'information qu'aura à gérer celui qui prend en charge les eportfolio passifs.

Le deuxième problème restera toujours même s’il peut être diminué en changeant de responsable de tutelle avec peut être le changement de niveau d’étude ou de région. Ainsi l’hébergement de la page d’accueil sera rattaché au rectorat auquel appartient l’apprenant quand il passe du primaire au secondaire ou au collège par exemple ou même à l’université. Les eportfolio passifs seront aussi hébergés au niveau hiérarchique dans lequel se situe l’apprenant.

L’inconvénient relatif à l’implication de l’institution dans la gestion du eportfolio ne peut être résolu, selon notre avis qu'en attribuant cette tâche à l’organisme hiérarchique de tutelle, ce qui revient à renforcer d’avantage le second inconvénient ou à léguer cette tâche à un FSI selon la direction, toujours de l’organisme de tutelle.
Gestion des accès aux eportfolio

L'importance accordée à un eportfolio dépend de la validité et de la sécurité des informations qu'il peut contenir. Autrement jusqu'à quel degré peut-on se fier aux informations contenues dans un eportfolio, est-ce que son contenu est bien celui convenu par les deux intervenants principaux, est-ce que l'un d'entre eux n'a pas eu accès pour mettre en value les aspects positifs et diminuer les faiblesses….

Répondre à ces questions revient à déterminer la liste des personnes qui ont accès à un eportfolio ainsi que leurs privilèges à une période donnée.

L'accès à un eportfolio dépend en premier lieu de son état passif ou actif et en second lieu de sa catégorie eportfolio par an, par niveau ou à vie.

En effet l'accès à un portfolio passif est uniquement en lecture, toutefois la liste des eportfolio accessibles dépend de sa catégorie et ce essentiellement pour le cas du eportfolio par niveau. En effet lorsqu'il s'agit du cas par niveau, la liste des eportfolio consultable doit être mise à jour chaque année et ce pour chaque apprenant en fonction de son niveau. Par exemple inhiber tout accès aux eportfolio anciens lors d'un passage de niveau.

La question qui se pose pour les eportfolio passifs concerne la liste des personnes qui peuvent les consulter :

laisser l’accès libre à tous génère des problèmes énormes (temps d’accès, temps de réponse, …)

limiter l’accès à l’apprenant, à ses parents et ses enseignants de l’année en cours génère aussi des problèmes liés à la gestion des ‘login’ et des mots de passes à attribuer à chacun et ce à chaque année pour ne pas évoquer les changements d'enseignant en cours de route ou au début.

autoriser l’apprenant, avec son ‘login’ et son mot de passe et donner le même ‘login’ et mot de passe à ses parents pour consulter le eportfolio de l’année en cours …

De multiples solutions se présentent qui doivent être prises en charge par l’hébergeur des eportfolio passifs en collaboration avec l’établissement où l’apprenant poursuit ses études et ce à chaque année.

La gestion du eportfolio actif est différente à cause de la multiplicité de la nature des privilèges lors des accès.

En effet l’établissement doit établir pour chaque apprenant la liste de ses enseignants par matière pour qu’un enseignant ne puisse modifier que les informations qui concernent la matière dont il a la charge. Aussi pourra-t-on penser à un sous-eportfolio relatif à chaque matière et seul l’apprenant et l’enseignant concernés pourront le mettre à jour. Les autres enseignants pourront uniquement le consulter.

Ces autorisations accordées aux enseignants sont aussi variables avec le système d’étude : trimestriel, semestriel ou annuel. Ainsi lorsqu’un enseignant termine son module à la fin d’un trimestre par exemple, ses privilèges de mises à jour des données lui seront supprimés pour devenir au niveau consultation par exemple ou même annulés.

Ces tâches de gestion de privilège incombent au gestionnaire du eportfolio de l’année en cours à savoir l’établissement en question ou l’administration de tutelle ou un FSI et ce selon la solution adoptée.

A coté de cette gestion des privilèges une gestion des traces de manipulations est aussi à prévoir car elle peut ajouter une rigueur et une consistance à l’information contenue dans un eportfolio.

Conclusion

Le concept de eportfolio a certainement de beaux jours devant lui toutefois certains choix techniques restent encore à préciser pour donner plus de crédibilité au contenu. Ces choix concernent la sécurité d’accès à ces eportfolio, à la gestion de leur durée de vie et l’espace qu’ils occupent.
Il est peut être utile de signaler que pour une meilleure exploitation des eportfolio il faudra aussi penser à une numérisation des diplômes. Ainsi et en fin de parcours universitaire par exemple, l'apprenant n'aura plus qu’à donner l'adresses de son eportfolio qui contiendra aussi la liste de ses diplômes numérisés. Nous n’insinuons pas un scanner de ses diplômes, mais un document électronique certifié et reconnu légalement comme équivalent au diplôme. L'idée est fortement inspirée de ce qui se fait au niveau de l'e-banking (virement électronique validé, signature numérique…) en lui attribuant aussi les sécurités et les standards du domaine.

Dans ce papier nous avons abordé des problèmes et des solutions du stockage et de l'accès à un eportfolio en proposant une distinction de trois catégories de eportfolio en plus d’une spécification d’un état du eportfolio (actif ou passif).

Les solutions proposées restent tributaires des contraintes de travail, de l’importance accordée à l’information ainsi qu’à d’autres choix stratégiques.

Webographie

PS14
Les initiatives ePortfolio francophones
Du parcours individuel à la construction d’un savoir collectif : le ePortfolio intégré à une plateforme de travail collaboratif.


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Résumé: ation d’un ePortfolio dans un environnement de formation en ligne « Espace TIM » va permettre le positionnement et l’évaluation des professeurs de Technologie Informatique et Multimédia (TIM). Cet outil de médiation doit faciliter, par ailleurs, les interactions entre les différents intervenants dans les formations (formateurs, conseillers pédagogiques) et constituer une étape dans le processus de construction collective de ressources pédagogiques.

Mots clés: Portfolio; FOAD ; Evaluation ; Travail collaboratif ; Formation des enseignants ; médiation, awareness

L'évaluation et le suivi de la formation des enseignants

L'Ecole Nationale de Formation Agronomique a en charge la formation initiale et continue des professeurs de l'enseignement agricole public. Depuis 2001, le Ministère de l'Agriculture a créé la section des professeurs de Technologie Informatique et Multimédia (TIM). Leur formation en alternance s'articule autour de périodes de formation à l'ENFA (17 semaines) et de stages pédagogiques en établissements (18 semaines) et s'appuie sur un dispositif de formation en ligne : Espace TIM". Depuis la rentrée 2004, cet environnement de travail intègre un ePortefolio, support pour le positionnement et l'évaluation des enseignants stagiaires. Nous allons analyser comment cet outil va par ailleurs favoriser les interactions entre les différents protagonistes : les enseignants en formation, les formateurs et les conseillers pédagogiques dans les établissements et constituer un vecteur pour le travail collectif. De même nous présenterons les différentes fonctionnalités développées pour la mise en œuvre de ce support et les technologies utilisées.

Le développement d’un ePortefolio sur « Espace TIM » correspond à une évolution du dispositif de formation mis en place depuis trois ans à l’Enfa. Par dispositif nous entendons tout ce qui entre en jeu dans la relation pédagogique durant le temps de formation, en présentiel et à distance, en nous appuyant sur la définition qu’en donne D. Peraya « un dispositif est une instance, un lieu social d’interaction et de coopération possédant ses intentions, son fonctionnement matériel et symbolique enfin, ses modes d’interactions propres. L’économie d’un dispositif – son fonctionnement – déterminée par les intentions, s’appuie sur l’organisation structurée de moyens matériels, technologiques et relationnels qui modélisent, à partir de leurs caractéristiques propres, les comportements et les conduites sociales (affectives et relationnelles), cognitives, communicatives des sujets » (Peraya, 1999). Il s’agit dans ce cadre, d’une part de permettre une meilleure régulation des activités des enseignants stagiaires, sur le plan de l’organisation, du contrôle et des interactions entre les intervenants ; d’autre part de constituer un support privilégié pour l’évaluation formative et finale des acquis de la formation (EQP).

Un outil pour la médiation

Depuis 2001, les échanges entre les différents protagonistes (stagiaires, formateurs Enfa et conseillers pédagogiques), ont lieu, selon les modalités suivantes :

- en présentiel, à l’Enfa et dans les établissements (suivi collectif et individuel).
- via une messagerie électronique (Extranet de l’enseignement agricole « educagri » : « conférences » stagiaires-formateurs Enfa et adresses électroniques individuelles pour les différents acteurs),
- via la plateforme « Espace TIM », support d’informations (organisation de la formation, supports de cours…) et espace de travail collaboratif (pages web...).
Après trois ans de fonctionnement, les formateurs Enfa ont ressenti la nécessité de tisser des liens entre des éléments parfois disparates générés par ces différents modes de communication et/ou de médiation. Avant d’aborder les concepts propres aux médiations techniques, s’appuyant sur des supports technologiques, nous abordons ici tout ce qui concerne la médiation « humaine » telle qu’elle est définie par C. Belisle « ensemble des processus par lesquels une personne s’intercale entre le sujet apprenant et les savoirs à acquérir pour en faciliter les apprentissages » (Belisle, 2004). Dans le processus de formation qui nous concerne, la plus grande difficulté rencontrée par les formateurs Enfa et les conseillers pédagogiques, étant la gestion de l’alternance entre l’Ecole de formation et les établissements où se déroulent les stages pédagogiques. Ces différents intervenants souhaitent avoir une vision plus globale des activités des stagiaires et disposer d’outils qui permettent de suivre leur progression. A ce jour, les conseillers pédagogiques remplissent des fiches « navettes » retraçant le déroulement du stage et précisant les points forts et les difficultés des stagiaires. Ces documents sont transmis d’un stage à l’autre par les stagiaires et archivés en fin d’année à l’Enfa. Les formateurs prennent connaissance des fiches « navettes » quand elles sont retournées par les stagiaires et interagissent par rapport à ces supports, principalement si des difficultés sont pointées, via les moyens de communication synchrone ou asynchrones cités précédemment. Le rôle d’intermédiaire principal est donc joué par le stagiaire, qui restitue, dans les différents lieux où s’élabore la formation, sa pratique, son expérience. Il le fait notamment en s’appuyant sur des productions demandées par les formateurs Enfa, comme des comptes-rendus de stage, des supports pour l’enseignement (progression, séances, séquences, projets d’animation…) et à l’oral au cours de séances de restitution en groupe.

A ce jour, ces différentes « traces » ne sont pas regroupées dans un lieu unique, accessible par les différents acteurs de la formation. Il nous a donc semblé important, de développer un support qui permette de les stocker, de les valoriser et de les conserver. Ainsi, s’appuyant sur l’expérience d’autres formateurs de l’Enfa qui utilisent un portfolio sur des supports papier (histoire-géographie, documentation) et sur les recherches menées au niveau international depuis le début des années 1990, nous avons proposé le développement d’un outils capable de faciliter les interactions entre les différents acteurs de la formation. Le ePortfolio intégré dans Espace TIM offre la possibilité d’organiser l’alternance, en la modélisant virtuellement – « le propre des médias est de fournir des systèmes symboliques de modélisation du réel » (Belisle, 2004) –, en structurant les activités des stagiaires : consignes, productions attendues, gestion du temps… Il permet par ailleurs de stocker leurs différentes productions, mais aussi les avis des trois partenaires de la formation (les stagiaires, les formateurs et les conseillers pédagogiques), tout au long de leur parcours. Ainsi, ce dossier évolutif, qui met l’accent sur le processus d’apprentissage, va constituer un document de premier plan pour une pratique réflexive des enseignants stagiaires et pour leur évaluation.

**Un support pour l’évaluation**

Le ePortfolio s’inscrit dans une optique d’évaluation formative, fondée sur des compétences à atteindre au cours de l’apprentissage. C’est-à-dire, pour les enseignants stagiaires, durant l’année de formation à l’Enfa, puis pendant les trois années suivantes (Appui à la Prise de Fonctions). Ce support est construit comme un cadre de référence qui défini les différentes capacités et compétences à acquérir pour exercer le métier d’enseignant. Il s’appuie fortement sur le référentiel professionnel du professeur TIM et sur la réflexion menée par les formateurs Enfa après trois années d’expérience de formation de ce corps d’enseignants. Chaque stagiaire va se situer par rapport à ce cadre de référence, à travers une analyse réflexive portant sur son expérience et sa pratique, dans le but de faire émerger des compétences. Il y adjoindra des productions demandées à chaque étape du parcours d’apprentissage. Pour les formateurs (Enfa et CP), cet outil va permettre de situer la
progression du stagiaire par rapport aux objectifs fixés (compétences, productions). Pour l’ensemble des protagonistes de cette formation, l’objectif est d’obtenir une double rétroaction : « sur l’élève pour lui indiquer les étapes qu’il a franchies et les difficultés qu’il rencontre, sur le maître pour lui indiquer comment se déroule son programme pédagogique et quels sont les obstacles auxquels il se heurte » (P. Perrenoud, 1998).

Le ePortfolio va aussi constituer un support pour l’évaluation finale des acquis de la formation, à l’issue de la première année. Les formateurs Enfa et les conseillers pédagogiques doivent donner un avis pour la titularisation des enseignants. L’enjeu est donc important et l’accès à l’ensemble des enregistrements contenus dans le ePortfolio (traces des interactions, productions, mais aussi compétences réflexives du stagiaire sur sa pratique et son expérience) devrait permettre de réaliser cette évaluation certificative dans de bonnes conditions.

L’évaluation de la formation telle qu’elle a été décrite précédemment, dans le cadre de l’ePortfolio, concerne chaque stagiaire à titre individuel (l’identification de chaque stagiaire pour accéder à son ePortfolio garanti la préservation des données). Les formateurs Enfa sont toutefois attentifs à la capacité qu’ont les enseignants stagiaires à s’engager dans des activités collectives. Nous allons présenter maintenant la démarche qui consiste à placer cet outil d’évaluation individuelle au sein de la plateforme Espace TIM basée sur un paradigme d’apprentissage collectif.

**Un vecteur pour le travail collectif ?**

Les enseignants stagiaire sont placés en situation de production de savoirs - leurs connaissances sont construites graduellement, à partir de l’expérience, de nouvelles acquisitions, mais aussi des échanges qui s’élaborent au cours de la formation en ligne et hors ligne -. Espace TIM a été conçu pour accompagner ce processus de construction d’un savoir collectif, en favorisant les situations d’interactions entre pairs et en proposant un espace pour la mutualisation des ressources. Ces échanges s’élaborent autour d’un objectif commun - P. Lerroux définit ce type de collaboration, « comme une résolution d’un problème par plusieurs agents, toutes les tâches composant le problème étant effectuées en commun par l’ensemble des agents » (Lerroux, P., 1995) - et donnent lieu à la production de réalisations communes : ressources, projets….Il s’agit pour ces enseignants de constituer un fonds « d’outils » utilisables et transposables aux différentes situations qu’ils vont rencontrer lorsqu’ils seront en poste. Avant la rentrée 2004, toutes les productions demandées aux stagiaires étaient mises en ligne sur Espace Tim et accessibles par tout le groupe en formation et par les formateurs. Chaque membre du groupe avait la possibilité de réagir via le forum ou la conférence (extranet) sur les productions mises en ligne, notamment, en vu de les faire évoluer. La mise en place du ePortfolio modifie ce processus, dans la mesure ou la publication de certaines productions (prises en compte dans l’évaluation), sont directement associées à l’ePortfolio et donc visibles uniquement par les formateurs Enfa. On peut alors redouter, à juste titre, que ce nouveau dispositif ne facilite pas cette coopération engagée avec les stagiaires des promotions précédentes.

Les formateurs Enfa, en mettant en place ce nouveau dispositif, ont fait le pari contraire et cette année universitaire 2004-2005 leur permettra de vérifier leur hypothèse : le ePortfolio, va constituer une étape dans la construction et la validation de certaines ressources qui pourront ensuite être déposées par le stagiaire, dans l’espace de travail coopératif sur Espace Tim. En effet, dans une situation d’évaluation formative, l’accompagnement des formateurs, dans le cadre du ePortfolio (consignes, commentaires, modifications, relance…) devrait faciliter la production de ressources. Il pourrait jouer, jusqu’à un certain point (dates de remise des productions pour leur évaluation finale), le rôle de « brouillon » (processus d’apprentissage). Jusqu’à présent les stagiaires hésitaient beaucoup avant de mettre leurs productions en ligne, redoutant sans doute le regard porté sur leurs réalisations par leurs pairs, même si un climat de confiance règne généralement dans les groupes. Un grand nombre d’entre eux, souhaitaient avoir la validation des enseignants avant de jouer le jeu du travail coopératif. Ce phénomène n’est pas propre aux stagiaires TIM. Travaillant depuis plusieurs années au sein de réseau de
l'enseignement agricole pour la production de ressources en ligne, nous avons été confrontés très souvent aux questions de la validation des productions et à tout ce qui touche à l'engagement des auteurs. Beaucoup d’enseignants réalisent des ressources intéressantes et originales qui pourraient être mises à la disposition de leurs collègues mais ils ne parviennent pas à sortir du huis clos de leur salle de cours pour les raisons exposées précédemment.

Les enseignants stagiaires pourront décider de publier ou non des documents déposés dans le ePortfolio, en les transférant vers l’espace de travail collectif. Pour ce faire, il faut prévoir des fonctionnalités qui permettent cette publication, et concevoir, en amont, une interface qui guide les stagiaires dans cette démarche. Le deux espaces concernés : l’ePortfolio et l’espace de travail collectif sont structurés de manière à ce que les stagiaires retrouvent dans l’un comme dans l’autre, les mêmes thématiques. Ils pourront alors apporter leur pierre à une production commune (ex : la création d’une commission informatique, la mise en place du B2i, la réalisation d’une séance d’enseignement…) ou présenter leurs travaux sur leurs pages personnelles.

En mettant en place un tel dispositif de formation nous avons voulu favoriser les activités d’apprentissage et de mutualisation et à travers celles-ci, permettre aux enseignants stagiaires d’acquérir des compétences inscrites dans leur référentiel professionnel, en ce qui concerne notamment l’élaboration d’outils d’organisation et de communication de l’information, l’aptitude à la diffusion de l’information, la capacité d’animation, d’organisation au sein d’un système d’information, l’aptitude à travailler en réseau… » (P. Lerroux, 1995). Toutes les ressources mises en ligne sur Espace Tim sont accessibles par les stagiaires, au delà de la période de formation. Ces supports, qui peuvent évoluer constituent à ce jour une base de ressources importante pour le travail en réseau des enseignants TIM. Les stagiaires pourront dorénavant conserver leur ePortfolio qui retrace leur cheminement durant la période de formation. On peut notamment envisager l’utilité de ce type de support dans une perspective de la validation des acquis et de l’expérience (VAE).

**Faire émerger une Conscience de Groupe**

Un de nos axes de recherche consiste à faire émerger une conscience de groupe (awareness) parmi les utilisateurs du ePortfolio qui est basé sur des prescriptions individuelles.

La conscience de groupe permet aux partenaires d’adapter et de planifier leur comportement en fonction de ce qu’ils savent réciproquement les uns des autres (Lonchamp, 2003) : "L'awareness est une compréhension de l'activité des autres, qui procure un cadre pour votre propre activité. Ce contexte est utilisé pour s’assurer que les contributions individuelles s’insèrent dans l’activité globale du groupe, et pour évaluer les actions individuelles au regard des buts et de l’évolution du groupe". Cette approche est novatrice dans la mesure où la conscience de groupe est toujours proposée dans des systèmes qui sont, à la base, fortement coopératifs voire collaboratifs : les utilisateurs ont une activité collective avec des buts différents voire identiques. L’émergence d’une conscience du groupe entre les utilisateurs du ePortfolio devrait favoriser les approches et les comportements coopératifs ainsi que la mutualisation des connaissances et des pratiques.

D’un point de vue organisationnel, plusieurs types d’utilisateurs sont amenés à utiliser le nouvel outil, chacun avec des objectifs précis. Il est utilisé par les stagiaires aussi bien pendant leurs semaines de stage que pendant les regroupements ENFA, mais aussi durant les trois années de leur APF (Appui à la Prise de Fonction). Sur leur lieu de stage, les professeurs conseillers pédagogiques ont également accès au ePortfolio, individuellement ou avec le stagiaire : une première dynamique de groupe, primitive, se crée.

Les formateurs ENFA sont considérés comme chef de projet concernant le ePortFolio. En effet, ils sont prescripteurs de consignes individuelles et de groupe pour leur section. Ils seront donc à la fois des facilitateurs et des consultants, pour suivre l’évolution du travail et assister les professeurs stagiaires.
Selon les fonctionnalités utilisées, les relations entre les différentes catégories d'utilisateurs pourront être plus ou moins fortes, hiérarchisées, typées (maître/élève), ... Mais, dans le cadre stricte du ePortfolio, les stagiaires sont contraints par les prescriptions qui leur sont faites et le groupe n'est pas mis en valeur.

Pour initialiser une conscience basique du groupe, des fonctionnalités classiques seront mises à disposition comme des outils de communication synchrones et asynchrones, la possibilité de partager des ressources, ... Ces fonctionnalités seront "visibles" dans le système ; leur utilisation sera libre. Elles vont permettre l'apparition d'une coopération dans le système par l'échange de messages, la mise à disposition de productions, etc ...

Selon (Kirsh Pinheiro, 2001) le support des techniques de conscience de groupe permet de faciliter l'estimation du "qui fait quoi" et de palier aux problèmes d'incertitude et d'équivoque qui peuvent entraîner de l'ambiguïté et des interprétations conflictuelles entre utilisateurs.

Pour faire émerger une véritable conscience de groupe entre les utilisateurs, nous proposons de formaliser et fournir des services autonomes et transparents qui initialiseront puis développeront la coopération entre individus et entre les individus et le système. Les services autonomes que nous voulons proposer sont transparents pour les utilisateurs car ils agiront de leur propre initiative. L'accent sera mis sur la flexibilité et l'adaptabilité ; les facteurs distance, mobilité, rythme d'apprentissage, suivi individualisé, coopération seront pris en compte et un partenariat entre les différents acteurs du système sera instauré, qu'ils soient humains ou artificiels.

Voyons plus en détails quels sont les différents travaux pouvant répondre à notre problématique.

Non seulement la plupart des services et documents disponibles sur Internet sont figés dans une même représentation, organisation, un même mode d'interaction, mais les utilisateurs n'ont pas les mêmes attentes, connaissances, compétences pour l'accès à l'information.

Ainsi diverses techniques sont proposées pour adapter/personnaliser la connaissance aux utilisateurs : les hypermédia adaptatifs, la modélisation utilisateur et les documents virtuels personnalisables. Elles appartiennent au domaine de recherche du web sémantique.

Les hypermédias adaptatifs (Garlatti, 2003) sont des systèmes qui adaptent les contenus présentés aux utilisateurs selon deux méthodes : la présentation adaptative qui manipule les contenus et la navigation adaptative qui concerne les liens.

La modélisation utilisateur consiste à créer puis gérer un modèle de chaque utilisateur en fonction de ses connaissances, des ses préférences, de ses objectifs, des ses usages du système. Il existe plusieurs types de modèles utilisateur qui peuvent être combinés : modèle individuel, stéréotype (groupe), modèle de recouvrement (par rapport aux concepts du domaine), un modèle partagé (au niveau applicatif).

Les documents virtuels sont des documents générés à la demande en fonction de plusieurs sources d'information : ils ne possèdent pas d'état persistant. Si l'utilisateur peut adapter/personnaliser le document réel produit en réponse à sa demande, on parle de document virtuel personnalisable. Cette personnalisation peut être le fait de contraintes ponctuelles données par l'utilisateur, de l'adaptation au modèle utilisateur ou du contexte (taille écran, vitesse de transfert, ...).

Sous la forme d'agents (Chevalier, 2002), les systèmes de recommandations visent à optimiser la recherche d'information de l'internaute en lui proposant automatiquement de nouveaux documents au regard de ses besoins ou de ses actions. Selon l'AFNOR, un agent intelligent est un "objet utilisant les techniques de l'intelligence artificielle qui adapte son comportement à son environnement et en mémorisant ses expériences, se comporte comme un sous-système capable d'apprentissage : il enrichit le système qui l'utilise en ajoutant, au cours du temps, des fonctions automatiques de traitement, de contrôle, de mémorisation ou de transfert d'information".
Cette capacité à agir sur le système nous paraît particulièrement intéressante à mettre en oeuvre dans notre ePortfolio. Grâce à leur autonomie, les agents pourront prendre des initiatives et agir sans intervention des utilisateurs. Grâce à leur capacité à communiquer et à coopérer, ils pourront échanger des informations plus ou moins complexes avec d'autres agents, avec des serveurs ou avec des utilisateurs, par exemple rechercher ceux d'entre eux ayant les mêmes centres d'intérêts. Les agents sont capables de raisonner et de réagir à leur environnement, ce qui leur permet d'enrichir leurs connaissances, par exemple au niveau des parcours des utilisateurs, de leurs actions et interactions. Enfin, leur mobilité leur assure une capacité de déplacement sur le réseau où ils accomplissent des tâches sans que l'utilisateur ait le moindre contrôle sur celles-ci.

Les systèmes de recommandations peuvent être personnalisées. Il s'agit d'aider les utilisateurs à faire leurs choix dans un domaine où ils disposent de peu d'informations pour trier et évaluer les alternatives possibles. Deux grandes approches complémentaires sont proposées dans la littérature : l'approche basée sur le contenu et fondée sur l'apprentissage automatique de profils utilisateurs et l'approche dite de filtrage collaboratif fondée sur des techniques de fouille de données. Comme dans les systèmes adaptatifs, ici aussi, nous pouvons noter l'importance des modèles/profils utilisateurs.

L'évaluation de ce dispositif – qui se déroulera à l’issue de cette première année universitaire - permettra d’une part, de le faire évoluer, en l’adaptant aux besoins des différents publics concernés, d’autre part de l’étendre à d’autres corps d’enseignants en formation à l’Enfa. Pour réaliser cette évaluation, nous appuyant sur les recherches menées par des collègues de l’IUFM de Montpellier, dans un contexte analogue (D. Bucheton, 2003), nous prendrons en compte les différents indicateurs qui nous permettront de vérifier l’implication des stagiaires (pratique réflexive, auto-évaluation, production de documents, interactions via les différents outils de communication…) et celle des formateurs (accompagnement, interactions…). Le volume des « interventions » des différents protagonistes pouvant être mesuré grâce à des indicateurs quantitatifs, tels que le nombre de messages échangés, de transfert de fichiers, l’évolution des valeurs (de 0 à 5) pour le positionnement et l’évaluation des stagiaires… De plus, avec le développement de notre recherche sur l’émergence d’une conscience de groupe, nous nous appuierons sur les fonctionnalités adaptatives implantées sur la plateforme « Espace TIM » pour réaliser cette évaluation avec une approche plus qualitative.

Présentation technique du portfolio des stagiaires de l’ENFA

Architecture

Etant donné la répartition géographique des utilisateurs du portfolio, il est nécessaire que le système soit accessible depuis des sites distants et par de nombreuses personnes. C'est pourquoi notre outils s'appuie sur une technologie client-serveur basée sur des clients légers (navigateurs internet), un serveur internet et un serveur de bases de données. Les technologies utilisées sont toutes issues du monde des logiciel libre. Le langage de programmation utilisé est le PHP1 et est interprété par un serveur internet 'apache'2. La base de données est une base Mysql3.

Intégration à l'espace TIM

Depuis trois années universitaires, les sections TIM en formation utilisent « l'Espace TIM » pour divers échanges avec leurs formateurs. C’est donc dans cet environnement que le ePortfolio a été intégré, avec la même interface graphique, afin d'en faciliter son utilisation. A l’avenir la partie présentation du portfolio sera réalisée à l'aide de 'feuilles de style', ce qui permettra une harmonisation graphique avec des environnements autres que « l'Espace TIM ». En effet le portfolio a été conçu comme un module à part entière qui pourra être intégré dans d'autres systèmes.

Pour accéder au portfolio, les utilisateurs doivent s'identifier. L'authentification (contrôle d'accès) est réalisée par le serveur web (authentification apache) lors de l'accès des utilisateurs à l'espace privé de « l'Espace TIM ». L'identification est
unique pour les utilisateurs que ce soit pour accéder à la zone privée de « l'Espace TIM » ou pour accéder au portfolio. En revanche l'authentification est réalisée en double. La première authentification est réalisée par le serveur internet (authentification apache) lors de l'accès de l'utilisateur à l'espace privé, la seconde et une vérification des paramètres de connexion à partir de la base de données. Cette deuxième authentification est nécessaire pour permettre au portfolio de gérer les droits de l'utilisateur. Droits que nous détaillerons plus loin. Ce dispositif de double authentification permet l'existence d'utilisateurs pouvant accéder à l'espace privé de « l'Espace TIM » mais ne possédant pas de portfolio.

**Composition du portfolio**

Le portfolio a été pensé comme un outils générique afin de pouvoir créer des instances de portfolio personnalisées en fonction des formations concernées. Chaque instance du portfolio est composée d'une page de présentation et d'un nombre de fiches propres à la formation permettant de segmenter le portfolio (4 pour les TIM).

Notre portfolio ayant été conçu pour les besoins de la formation des TIM, les fiches sont actuellement composées de 3 zones distinctes. Le nombre de ces zones évoluera en fonction des besoins exprimés par les autres sections. Ces zones seront activables ou non pour personnaliser le portfolio.

Les 3 zones actuellement existantes sont :

- **Les compétences attendues** : ces compétences sont évaluées individuellement et sont regroupées en thèmes de compétences. L'évaluation des compétences peut se faire de 2 façons différentes selon les paramètres du portfolio. Elle peut être réalisée binaire (acquis/non-acquis) ou par une valeur allant de 0 à 5 (échelle de notation aujourd'hui figée mais personnalisable à l'avenir).

- **Les productions attendues** : au cours de leur formation, les stagiaires ont des productions à réaliser. Ces productions permettent aux formateurs d'évaluer les compétences des stagiaires. Les productions sont envoyées au serveur sous forme de fichier électronique. Le dépôt de chaque production peut être soumis à une date limite. Au moment de leur dépôt, les ressources sont décrites par le stagiaire, ainsi chaque ressource déposée possède une description XML (eXtensible Markup Language) décrite par une DTD (Document Type Definition). Une feuille de style XSL (eXtensible Stylesheet Language) est associée aux descriptions.

- **Une zone de commentaires** : les utilisateurs peuvent directement communiquer sur le contenu de la fiche en laissant des commentaires. Chaque commentaire est identifié et daté. Les utilisateurs peuvent modifier leurs commentaires, il peuvent également les supprimer lorsqu'aucune réponse n'a été postée.

**Utilisateurs et utilisations**

Le portfolio est accessible par trois utilisateurs différents, stagiaire, conseiller pédagogique et formateur ENFA. Chacun des utilisateurs peut évaluer les compétences et poster des commentaires sur le portfolio du stagiaire. Seul le stagiaire à la possibilité de déposer des ressources. Le stagiaire n'accède qu'à son portfolio alors les conseillers pédagogiques peuvent accéder aux différents portfolio des stagiaires qu'ils encadrent. Les formateurs ENFA peuvent accéder aux portfolio de tous les stagiaires de leur section.

**Notifications aux utilisateurs et historique**

Lors d'une action sur le portfolio (dépôt de ressource, évaluation de compétence, ajout de commentaire), le système envoie une notification par email aux utilisateurs concernés (ormis l'auteur de la modification). Cette notification précise l'action réalisée, l'auteur de cette action ainsi que la date de l'action. Dans le cas d'une évaluation, la notification indique également l'ancienne et la nouvelle valeur de l'évaluation. La notification d'un commentaire inclut un lien cliquable qui permet
d'accéder directement au nouveau commentaire. Chaque action citée ci-dessus fait également l'objet d'un historique qui permet de retracer l'évolution du portfolio du stagiaire.

Notes


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Eporfolio authorship for teachers: considerations of flexibility and productive constraints

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Abstract: For two years, masters degree students in education (IUFM and university of Caen), have to design an eportfolio (using the BSCW platform). Lessons learned indicate that giving no strict model of eportfolio leads to an interesting variety of productions, with a great deal of creativity (use of a weblog, collective eportfolio with common parts and individual parts, use of pictures and metaphors...). The communication will elaborate upon the first results of this experimentation of eportfolio, advocating freedom of elaboration in this specific context.

Keywords: eportfolio, éducation, TICE, praticien réflexif

Introduction
Dans le système éducatif français, les portfolios n’ont pas la popularité qu’ils rencontrent en Amérique du Nord ou dans les pays nordiques. Une des premières raisons tient au fait que les enseignants français, une fois passés les concours de recrutement, sont fonctionnaires et n’ont pas à être recrutés par des établissements ou districts scolaires. Nulle nécessité d’attester des compétences acquises pour obtenir un poste, le grade obtenu étant suffisant. Une seconde raison est sans doute liée à la tradition éducative française, qui s’appuie sur des disciplines d’enseignement fortes et favorise des formes d’écriture exigeantes (comme la dissertation). Ainsi, les enseignants stagiaires (en IUFM) doivent élaborer et soutenir un mémoire professionnel. Enfin, subsiste une certaine méfiance vis-à-vis des technologies quelles qu’elles soient, vues comme de simples outils n’ayant qu’un rôle subalterne. Pourtant, il semble que la réalisation d’un eportfolio électronique (que l’on nommera eportfolio) constitue une activité intéressante pour les enseignants et les formateurs et que ce type de production est susceptible de prendre une place importante dans la formation, notamment en raison du cadre européen dans lequel elle se déploie de plus en plus.

A l’IUFM de Caen, dans le cadre du master professionnel (anciennement DESS « formation de formateurs : mutations et professionnalité », IUFM et Université de Caen Basse-Normandie), l’évaluation du module de tronc commun sur les technologies de l’information et de la communication (TIC) dans la formation consiste en l’élaboration et la soutenance d’un eportfolio. Deux promotions d’étudiants se sont prêtées à cet exercice, ce qui donne des premiers éléments pour analyser son intérêt, au vu des productions obtenues.

Dans cet article, nous allons essayer de tirer des enseignements de ce travail autour des portfolios électroniques, en précisant les idées qui nous ont conduit à proposer cette modalité d’évaluation et en décrivant quelques caractéristiques des eportfolios qui ont été réalisés. Nous étendrons ensuite la réflexion sur l’intérêt même de ce type de production en formation dans le contexte français.

Un eportfolio en formation de formateurs: pourquoi, comment ?

Pourquoi un eportfolio ?
Le choix du portfolio s’est peu à peu imposé compte tenu du contexte et des objectifs de la formation de DESS et du module sur les TIC dont nous avons la charge avec Domique Lachiver.

Les étudiants d’un master professionnel dans le domaine de la formation de formateurs n’ont pas vocation à développer des applications informatiques. Par contre, ils peuvent être amenés soit à en prescrire la réalisation, soit à participer, en tant qu’expert du domaine de la formation, à leur développement. Si la maîtrise de
« grandes » compétences techniques de réalisation ne peut être visée, un autre registre de compétences est requis. En outre, le pari est que les TIC peuvent leur être utiles dans leur formation elle-même et plus tard dans leur travail.

Le public, c’est-à-dire l’ensemble des stagiaires, est très hétérogène. D’une part dans leur familiarité avec les TIC. D’autre part dans leur cursus et leurs objectifs. Certains sont des étudiants qui viennent de terminer leur maîtrise. D’autres ont une longue expérience professionnelle, souhaitent se réorienter ou prendre du recul par rapport à leur activité.

Dans le module du DESS consacré aux TIC (technologies de l’information et de la communication), on cherche à favoriser un développement conjoint de maîtrise technique minimale (sans pouvoir bien cerner ce que cela implique) et de réflexion sur les TIC elles-mêmes et leurs rôles en formation. Pour cela, nous pensons qu’il faut mettre en place des situations obligeant les étudiants à utiliser les TIC afin de se les approprier. En produisant quelque chose, ils seront amenés à mieux comprendre l’intérêt et les limites des TIC, voire même à analyser leur processus de travail. Ainsi, au cours de la formation, nous leur demandons de produire un texte à plusieurs en collaborant autant à présence qu’à distance (à l’aide d’une plate-forme, ici BCSW), à critiquer les productions d’autres groupes et enfin à prendre en compte des critiques dans leur propre production, expérience qui leur fait prendre conscience des difficultés du travail en groupe partiellement distant et mieux percevoir certains points d’achoppement de l’enseignement à distance.

La question s’est posée de l’évaluation finale du module. La première année du DESS (il y a trois ans), nous avions choisi de leur demander de réaliser une présentation de type PréAO. Cette modalité d’évaluation s’est avérée un peu décevante. En effet, sans recul de la part des stagiaires, leur production reste empreinte de naïveté et témoigne de conceptions non mises à l’épreuve. Cela renforce aussi une vision des TIC comme simples moyens modernes de présentation, ne conduisant que très marginalement à réfléchir sur des processus complexes d’appropriation. Un engagement peu clair, des difficultés à avoir un regard sur le résultat obtenu et à en discuter, l’épreuve se résumait parfois à montrer quelques compétences techniques plus ou moins récemment acquises. C’est d’ailleurs dans ce registre purement technique que l’exercice était réinterprété par les stagiaires.

Nous avons alors essayé de proposer une autre modalité d’évaluation qui puisse :

- les encourager à utiliser les TIC dans leur formation, dans des réalisations concrètes,
- les inciter à mettre en perspective les différents éléments de leur formation,
- les aider à développer une réflexion sur leur propre parcours,
- être facilement partagée avec les autres stagiaires.
- permettre à chacun, quelles que soient ses compétences techniques, d’arriver à un résultat significatif et utile.

Il s’agissait de répondre à l’hétérogénéité des stagiaires (un public avec des expériences et des objectifs différents) et de limiter les réinterprétations de la consigne de travail en termes simplement techniques. Le portfolio électronique semblait satisfaire à ces différentes contraintes.

**Quel type de portfolio réaliser?**

Selon la *Northwest evaluation association*, un portfolio est une collection finalisée de travaux d’un étudiant attestant de ses efforts, progrès et réalisations au cours du temps (*“a purposeful collection of student work that demonstrates effort, progress and achievement over time”*). Les aspects génétiques et réflexifs jouent un rôle essentiel, articulés selon trois finalités générales (Barrett, 2003) : résumer les travaux réalisés par un étudiant ; lui donner l’occasion de réfléchir sur ce qu’il a appris en les faisant et sur ce qu’il est capable d’accomplir ; identifier de nouveaux besoins et de nouveaux objectifs d’apprentissage. Trois métaphores (Diez, 1994) permettent de comprendre les différentes facettes d’un portfolio : c’est à la fois un miroir (soulignant la nature réflexive du portfolio, l’étudiant peut voir ses progrès au cours du temps),
une carte (facilitant l’auto évaluation et permettant de se donner un plan et des buts) et un sonnet (ce dernier point souligne la nécessité de se montrer créatif tout en respectant des règles imposées comme en poésie).

Souhaitant tenir compte d’une diversité d’objectifs et de situations des stagiaires (certains devant chercher un travail à l’issue de la formation et étant intéressés à la réalisation d’un portfolio de présentation, d’autres souhaitant plutôt faire le point sur leur propre parcours), nous avons opté pour une consigne brève, demandant la réalisation et la soutenance d’un portfolio électronique avec une échéance (laissant environ 7 à 8 mois pour la remise et la soutenance), présentant leur parcours, notamment au sein de la formation en cours. Nous les avons enjoints de consulter des exemples via internet (notamment les sites québécois fournissant de très nombreux exemples de portfolios électroniques en français). En cours de route, des séances de type travaux pratiques leur ont permis d’acquérir les compétences utiles dans la réalisation informatique, en essayant de ne pas fournir un modèle tout fait qu’il n’y aurait plus qu’à instancier (ce qui n’a pas fonctionné la première année, un certain nombre d’étudiants ayant directement repris un modèle donné lors d’un exercice).

Afin de préciser le contrat, nous avons insisté sur le caractère personnel de la réalisation demandée. Il ne s’agit pas tant de tout effectuer sans aucune assistance, bien au contraire, mais de faire des choix (dans les ressources intégrées, dans le mode d’organisation, etc.) et de les assumer. En aucun cas, une quelconque virtuosité technique n’est recherchée, plutôt une cohérence dans la réalisation.

Notons enfin qu’il s’agit bien ici de construire des portfolios électroniques, bien différents des portfolios sur support papier, que nous n’aurions jamais proposé de réaliser. En effet, utiliser les TIC est déjà une contrainte initiale du module dont nous avons la responsabilité. En outre, l’informatique et internet offrent des possibilités qui étendent le spectre de conception et d’usage des portfolios : facilité de révision et d’évolution, intégration d’aspects multimédias, multiples structurations par des réseaux de liens hypertextes, partage et collaboration dans la conception, publication aisée pour un large public (mise en ligne), etc. Tous ces éléments concourent à faire des eportfolios des produits qualitativement différents des portfolios non électroniques, amenant également d’autres processus de réalisation.

**Premier bilan des réalisations**

Sur les deux ans, une trentaine de portfolios ont été construits et soutenus.

Comme premier élément de bilan, on peut constater la satisfaction quasi-générale des étudiants qui se sont engagés dans l’élaboration de leur portfolio (seule une petite minorité, sur les deux ans, a fourni un travail insuffisant). Pour la plupart d’entre eux, s’ils ont dû y consacrer du temps (et pour certains beaucoup de temps), ils ont été contents de se prouver à eux-mêmes qu’ils pouvaient produire quelque chose avec des technologies qui leur étaient au départ étrangères. Travail qu’ils n’auraient sans doute pas effectué, s’il n’avait pas été obligatoire, montrant que la contrainte est productive. L’investissement, tant temporel qu’intellectuel, est à souligner. En fait, cela les incite à utiliser les TIC pour produire sur un sujet qui les concerne : eux-mêmes !

Au plan technique, quelques uns ont eu des difficultés à mettre en ligne leur production sur la plate-forme, notamment en raison de problèmes classiques de confusion entre adresses relatif et absolu. Toutefois, avec une légère assistance (surtout la première année) que nous avons pu leur fournir ou que certains ont pu trouver auprès de leurs proches, les derniers obstacles ont pu êtrier travail afin de réaliser un portfolio de présentation, utile dans leur recherche d’emploi.

Certains appliquent un modèle prêt à l’emploi (surtout vrai la première année), mais la plupart inventent une forme assez personnelle, montrant qu’ils savent tirer parti de la marge d’interprétation qui leur est laissée. S’il est difficile de préciser ce qu’ils ont appris (puisqu’elle forme choisie n’est en rien un test de compétences), cette réalisation semble correspondre aux objectifs que nous assignons à cette forme d’évaluation. Ils en comprennent tous l’intérêt et apparaissent prêt à réinvestir dans
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leur contexte professionnel (ce qui est en train de se produire pour certains d’entre eux).

L’analyse des portfolios réalisés permet de mettre en évidence des caractéristiques intéressantes.

Analyse de quelques caractéristiques des portfolios réalisés

Quelle interprétation des portfolios ?

Comme la notion de portfolio étant inconnue des stagiaires, des recherches sur internet leur ont permis de se forger leur propre vision de ce concept, de se « l'approprier progressivement ». Chacun « invente » sa propre définition ou reconstruit une définition qui lui correspond.

D’abord, il s’agit bien d’un retour sur son propre parcours. Une stagiaire parle d’un « film qui relate les acquisitions du formé ». Pour d’autres :

« Il m’a permis de rassembler mes idées, mes points de vue, mes questionnements sur mon cheminement personnel et professionnel ».

« Il m’a permis de visualiser le fil conducteur de ce que je suis professionnellement et de vérifier la cohérence ».

« un moment où on souffle pour réfléchir sur son parcours ».

« Il est pour moi un témoin de mes compétences professionnelles et de mes réalisations présentées de manière vivante et je le perçois comme un parcours avec un point de départ et un point d'arrivée ».

« C’est une collection de différents échantillons ou travaux qui permet de documenter, pendant une certaine période, le cheminement effectué dans un domaine donné ». 

Cela touche à l’identité personnelle : « Bâtissant moi-même ce portfolio, j’ai exercé des choix sur son contenu, je souhaite qu’il représente le plus justement possible ce que je suis ».

La fonction « miroir » du portfolio est bien soulignée. Comme il va (ou peut) être lu (notamment par les autres stagiaires), on fait attention à ce qu’il dévoile et à quelle part de soi on peut dévoiler, dans l’idée de partage : « L’essentiel, ce sont les prises de conscience que j’ai faites tout au long de cette année, je vais faire le tri et partager ce qui peut l’être ».

Mais documenter son propre parcours se fait dans un souci de projection vers l’avenir. Cela aide à mieux se connaître, « Il m’a permis de faire une mise à jour de mes connaissances, de mes compétences afin de développer une plus grande conscience de moi-même et d’analyser mon développement professionnel et personnel ».

Comme le souligne un stagiaire, cela peut donner l’occasion de conduire soi-même son cheminement personnel et professionnel : « mieux visualiser mon cheminement et ainsi en vérifier la cohérence », et « préciser et mieux articuler les objectifs que je poursuis dans ma vie professionnelle ».

La même idée est exprimée par un autre stagiaire :

« Il sert à recueillir des informations sur ses croyances, ses connaissances, ses habiletés et ses compétences afin de documenter son cheminement, de systématiser ses démarches de réflexion afin de développer une plus grande conscience de sa pratique, de l’analyser et de prendre des décisions éclairées menant au développement professionnel et personnel. Il permet aussi d’accéder à une meilleure compréhension de ses idées et de ses pratiques ».
Allant jusqu'à une forme plus intime : « Parce que je suis celui qui le bâtit, qui exerce mon choix sur son contenu. Il est le fil conducteur de mon parcours parce qu'il est ce que je suis et ce que je deviens ; sa cohérence ».

La prise en compte de l'aspect réflexif est clairement mise en évidence : « le portfolio permet de développer un esprit autonome, réflexif et critique, par rapport à sa propre trajectoire ».

Pour certains, l'aspect présentation est prédominant. Ainsi, reprenant la classification proposée par la Direction des ressources didactiques du Ministère de l’Éducation du Québec (MEQ 2002) en trois catégories : portfolio d’apprentissage (souligne la progression du formé dans ses apprentissages) ; portfolio d’évaluation (évaluation des compétences du formé) ; portfolio de présentation (exposition et présentation des réalisations du formé), les plus jeunes ont privilégié cette dernière catégorie. Le futur lecteur (spectateur ?) est présent : « Présentation personnelle, Mais çà, c'est une autre histoire... (qui peut trouver sa suite dans mon cheminement personnel, c'est vous qui voyez, c'est vous qui cliquez !) ».

Aspects multimédias

Enrichir la présentation par des images est souvent recherché. C'est l'occasion d'employer une palette plus riche pour se décrire : « J’aurais souhaité y ajouter des photos, des musiques, des réalisations personnelles, aquarelles ». Le eportfolio apparaît comme une sorte de valise aux sortilèges.

**Figure 1. Image du portfolio d’un stagiaire**

Mais l’image n’est pas seulement illustrative, elle se veut démonstrative : « montrer des images qui révèlent mes apprentissages ». L’image devient représentative d’une métaphore

Un premier exemple de ce type est celui des engrenages. D’abord introduit la première année par une stagiaire (simple fichier GIF animé, figure 2) plutôt comme élément illustratif, montrant l’association progressive des différents éléments de la formation, il devient un élément essentiel pour une autre stagiaire. La page d’accueil a pour fond un engrenage (figure 3) puis différents engrenages sont présentés (figure 4), d’abord séparés, puis peu à peu associés. Le choix des couleurs (bleu pour la formation, orange pour évoquer les raids en voiture dans le désert) est également significatif.

**Figure 2. Une première image d’engrenage**
Mais ce recours aux engrenages n'est pas expliqué dans les différents textes du portfolio (il l'a été oralement lors de la soutenance). Par contre, une autre métaphore est fournie et expliquée, celle du puzzle qui apparaît sciemment comme un symbole récurrent (portfolio de S., http://www.membres.lycos.fr/sfouenard) : « Le puzzle m'a en effet paru être une image particulièrement intéressante : un ensemble de pièces, chacune unique, qui mis bout à bout forment un tout cohérent et signifiant... Cette métaphore du puzzle est donc à comprendre comme une représentation symbolique de la formation en associant les concepts d'unicité, d'identité, de cohésion, de coopération et d'accompagnement vers le changement. »

On trouve par ailleurs d'autres métaphores imagées, faisant le lien entre la formation et une passion : l'escalade, la navigation. Dans un autre registre, un stagiaire a choisi le portrait chinois pour se définir, un autre a repris l'introduction du questionnaire de Proust.

**Aspects généraux**

A l'exception notable de la production de S. déjà citée, plus centrée sur des contenus que sur un parcours, la quasi totalité des eportfolios est organisée de manière arborescente. Les liens transverses sont absents. L'organisation reste ainsi très hiérarchique. Cela peut être dû à manque de capacités techniques, mais surtout à une conceptualisation encore balbutiante. La traduction d'un parcours reste dans un mode linéaire, les relations entre les éléments ne sont pas vraiment matérialisées. Peut-être ces relations ont-elles été effectuées mentalement et la construction progressive du eportfolio a-t-elle permis de les faire émerger ? Notons qu'un
stagiaire a utilisé une carte de concepts, montrant l’organisation de son portfolio, la plupart se contentant des menus, classiques dans les sites webs.

Cette linéarité se retrouve, mais sous une forme beaucoup plus intéressante, dans la production de L. qui a opté pour un weblog et a réalisé une sorte de journal de bord de sa formation (http://tison.dess.free.fr/#107048112978364349). Cette chronique intègre de nombreux liens (articles en ligne, sites d’élèves et d’institution, etc.) utilisant pleinement les capacités d’ouverture des pages web. La mise en ligne, dès le départ, lui a permis d’entrer en contact avec d’autres étudiants (au Canada et aux États-Unis) et L. a pu utiliser les fils Atom pour se mettre automatiquement à jour avec ses correspondants (et permettre l’intégration et la diffusion de ses pages par des procédés de syndication de contenus). Cette initiative montre une réinterprétation productive de la consigne initialement donnée, qui n’aurait pu se produire avec un dispositif pré formaté de réalisation de portfolios.

Une autre réinterprétation intéressante a été opérée par un groupe de trois personnes, ayant décidé de travailler ensemble. Ils ont réalisé un eportfolio avec une partie commune donnant accès à trois parties individuelles, chacune d’entre elles témoignant d’une recherche graphique élaborée (métaphore des engrenages déjà citée, de la navigation, là dernière ayant mis en avant sa passion pour la musique).

Seulement deux stagiaires ont décidé de rendre leur production publique (les adresses ont été données précédemment).

Pour conclure sur des aspects généraux, on observe une synthèse dans les réalisations entre les aspects professionnels et les aspects personnels (loisirs ou passions), des métaphores ou des illustrations permettant de faire le lien entre ces différents aspects. Certains soignent le côté esthétique et la finition, attestant de cette manière de compétences acquises, d’autres privilégient l’écriture, témoignant d’un engagement fort dans un processus réflexif sur leur parcours et leur formation.

Pour terminer ce rapide tour d’horizon, les réflexions d’un stagiaire, professeur des écoles depuis un certain nombre d’années, illustrent une manière d’appréhender cet exercice de conception d’un eportfolio individuel. Reprenant une citation de Patrice Pelpel (« Apprendre, c’est rajeunir et en accepter le risque » ; Se former pour enseigner, 1993), il considère l’élaboration de l’eportfolio comme un accompagnement à la réflexivité sur son processus de formation : « consciente de mes résistances à parler de moi-même dans mes apprentissages et surtout dans mes tâches professionnelles, j’espère que ce support m’aidera à construire cette réflexion. ». Son écrit atteste des liens qu’il arrive à tisser entre les différents modules et activités de la formation. Ayant pris conscience de sa réticence à parler de son travail dans le détail pour un public non averti, il s’engage dans ce qu’il nomme une « démarche métacognitive ». Enfin, selon lui, l’année de formation lui a « permis de renouer avec le plaisir d’écrire ».

Discussion

Dans le contexte d’un master professionnel de formation de formateurs incluant une formation autour/avec les technologies de l’information et de la communication, la réalisation de eportfolios paraît très pertinente. Nous continuons d’ailleurs à adopter cette modalité d’évaluation pour la nouvelle promotion. Elle répond bien à des objectifs d’utilisation finalisée des TIC dans une production « intéressante » et d’engagement d’une réflexion personnelle des stagiaires sur leur propre parcours. La diversité des stagiaires, ainsi que l’hétérogénéité de leurs compétences, loin d’être un handicap, constitue une richesse que la réalisation des eportfolios contribue à révéler.

Toutefois, si la réalisation de eportfolios connaît une extension notable, ce n’est pas sûr qu’elle conserve son intérêt. En effet, la rareté constitue une partie non négligeable de cet intérêt, qui disparaîtra dans la banalisation, destin de nombreuses innovations. Amenés à en produire plus souvent, les stagiaires ne s’engageront plus de la même manière, sauf à maintenir un eportfolio tout au long de leur carrière, contexte qui en change la nature.
Cette écriture de eportfolio rejoint les préoccupations très actuelles du récit en formation. Il apparaît d’ailleurs que ce n’est pas forcément l’écriture elle-même qui est centrale, mais le dispositif dans lequel cette écriture est insérée : c’est du dispositif même que peut naître la nécessité de mettre en récit son expérience (Donnadieu, 2004). La posture de praticien réflexif, qui lui est indubitablement associée, a certainement des limites qu’il conviendrait de repérer. Elle correspond bien à l’esprit d’une formation de type DESS (master professionnel) sur la formation de formateurs, mais n’a pas forcément vocation à être la seule posture requise. Selon le cas, un engagement plus important dans l’action, des retours sur les contenus à enseigner peuvent induire d’autres formes de travaux que la réalisation ou la mise à jour d’un eportfolio.

Une partie de la réussite de cet exercice vient de son inscription dans un temps contraint, avec un échéancier, une terminaison. On ne va pas renseigner son portfolio en continu. Notons que des systèmes sont actuellement conçus pour permettre de garder un enregistrement complet de la vie d’une personne. Ainsi, dans le cadre du projet MyLifeBits, un système éponyme est conçu pour enregistrer et gérer toutes les données numériques d’une vie (Gemmel et al., 2003). Il est actuellement expérimenté : a ainsi été numérisé tout ce qui est possible sur la vie de Gordon Bell. La tentation va sans doute être grande de faire des eportfolios en continu dans le cadre d’une carrière. Garder tout change fondamentalement la nature même de ce travail. Il n’est pas sûr que ce soit souhaitable, certaines formes d’oubli sont indispensables dans des processus d’apprentissage.

Ensuite le contexte de déploiement peut conduire à des usages plus contraints et moins intéressants (contexte d’interopérabilité, du rendre compte, etc.). Avec Georges-Louis Baron (Baron & Bruillard, 2003), nous avons présenté plusieurs dilemmes auxquels les colleges of education (aux États-Unis) doivent faire face avec le développement des eportfolios, dans le contexte actuel où les institutions sont tenues de rendre compte (accountability) à différentes autorités et organismes (notamment d’accréditation) de leurs actions de formation (Carney, 2003). Une des tensions bien repérées est qu’un portfolio très structuré, souvent conçu comme une base de données en ligne, pour satisfaire aux besoins d’uniformité dans les données d’évaluation d’une institution, risque de faire perdre la créativité d’expression qui a été l’étendard des portfolios depuis des années. De l’évaluation « authentique et réflexive » à l’agrégation de données pour l’accréditation, les problèmes pratiques et les questions de pouvoir changent les orientations.

Pour revenir au contexte français, la fertilité du concept de eportfolio tient pour une bonne part à sa malléabilité, rendant essentielle sa définition locale dans un contexte donné. Pour cela, il importe de le reproblématiser dans une situation particulière, non d’appliquer une sorte de méthode générale à un contexte. Disposer d’un produit dédié à la construction de eportfolio risque d’assécher la créativité, alors que la marge de réinterprétation qui est laissée aux stagiaires est essentielle. Si l’expérience que nous avons est encore limitée, elle semble indiquer, dans la culture de la formation en France, que les eportfolios peuvent jouer un rôle très important, leur généralisation risque d’en changer fortement la nature et l’intérêt.

**Références**


PS14 - Les initiatives ePortfolio francophones


Autonomie et évaluation : le ePortfolio comme outil de collaboration pour les différents acteurs d’un dispositif de formation.

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Mots clés : Autoconstructivisme, pratiques collaboratives, tutorat informatisé, autonomie, individualisation, acquisition de connaissances.

De l’individualisation vers une autonomie des apprentissages

Le contexte est celui de l’apprentissage de la bureautique pour une population d’environ 200 étudiants en première année de Techniques de Commercialisation de notre Université.

La première difficulté rencontrée est une hétérogénéité importante des niveaux de connaissances. Elle va, même encore à ce jour, de l’étudiant expert dans la pratique d’un logiciel de bureautique tel que Word à l’étudiant n’ayant jamais pratiqué sur un microordinateur. Le constat de cet écart nous a amené à nous poser la question des moyens à mettre en œuvre pour parvenir à faire atteindre un niveau de connaissances minimales aux néophytes, tout en respectant l’acquis antérieur, le « déjà là » cher au professeur Gilles Lemire (Harvey et Lemire 2001), et en favorisant son développement pour les étudiants les plus avancés.

La mise à disposition d’un dispositif de formation individualisée en ligne nous est apparue comme un outil permettant cette individualisation de la formation.

Après une étude comparative des différentes solutions de formation effectivement opérationnelles sur le marché, nous avons retenu la solution Médiaplus proposée par la société ENI. Cette solution permet à l’apprenant de s’approprier à son rythme les fonctions d’un des logiciels de la suite Office de Microsoft dans le contexte même du produit bureautique, et non dans un environnement simulé comme c’est souvent le cas. Cette spécificité est pour nous précieuse car elle favorise l’adhésion des étudiants déjà en partie « expert » à la démarche de formation.

Chaque fonctionnalité se présente sous la forme d’une leçon à écouter (voir figure ci-dessous) puis d’une question de contrôle pour vérification de l’acquis. Cette vérification, compte tenu de l’approche choisie par Médiaplus, a l’avantage de mettre très régulièrement l’étudiant « en situation de produire » dans le contexte du logiciel pour la réalisation de la tâche demandée.
La démarche pédagogique induite par le produit (diagnostic des besoins, individualisation de la formation et bilan des acquis), bien que très séduisante, nous est apparue de prime abord difficile à mettre en œuvre dans notre contexte d’une formation universitaire. Nous retenons cependant de cette démarche :

l’individualisation de la formation non pas basée sur le volume de leçons à écouter mais par le rythme d’écoute de ces mêmes leçons,

le bilan des acquis ; la plateforme mémorisant l’activité de l’étudiant (temps passé en écoute, résultat des questions)

Cette démarche restait néanmoins pour nous un premier embryon vers notre objectif qui vise à permettre la différenciation des cheminement, sous la responsabilité de chaque apprenant. Le constat fait lors des premières expérimentations (le contexte est plus largement décrit dans Harvey et Lemire 2001, pages 109 à 114) a permis de pointer les limites de tels dispositifs.

Sans cadre et sans accompagnement, l’étudiant se fixe –malheureusement trop souvent- pour unique objectif de répondre à la question posée ; son écoute de la leçon se focalise sur ce seul but en laissant de côté la richesse des autres notions introduites par chaque leçon. Si l’on n’y prend garde, l’individualisation des apprentissages, par l’utilisation de ce produit dans notre contexte, est rapidement perçue par un étudiant comme un système de conditionnement à répondre juste aux questions de qualification !

La recherche de la responsabilisation de chaque apprenant dans sa démarche d’acquisition de connaissances prenait dans ce contexte tout son sens.

Cette question de la responsabilisation individuelle et collective des étudiants nous a amené à nous réinterroger sur notre dispositif d’évaluation de l’acquisition des connaissances. Dans sa première version, notre dispositif reposait essentiellement sur une évaluation mécanique au travers de notes issues d’examens formels ou de résultats collectés par le système de formation individualisée Médiaplus (temps d’écoute, résultats des questions). Nous n’avions pas et nous ne proposions pas aux étudiants d’outils leur permettant de valider pour eux-mêmes de manière continue l’appropriation de connaissances, le développement de leurs capacités à maîtriser les fonctions souhaitées de chacun des logiciels de bureautique.

**L’évaluation comme outil d’accompagnement vers l’autonomie des apprentissages : le protocole FISAD**

Depuis près d’une décennie, notre équipe lyonnaise, avec l’implication de collègues québécois, explore les voies de l’autonomie, du travail collaboratif, de la responsabilisation des apprenants (Harvey et Lemire 2001). Nos préoccupations se nourrissent entre autres des « Sept savoirs nécessaires à l’éducation du futur » (Morin 2000), du « Manifeste de la Transdisciplinarité » (Nicolescu 1996). Et nous professons, avec d’autres, que plutôt que d’enseigner, d’apporter des savoirs, il
convient d’abord de permettre aux apprenants de s’approprier les connaissances et d’en construire leurs propres représentations (Bourriquen et Journay 1999).

Cela posé, le constat est manifeste. Dans nos formations diplômantes, l’évaluation a un fort pouvoir d’orientation du comportement de l’apprenant face aux activités académiques. Si l’on n’y prend garde, le système évaluateur pervertit le système d’apprentissage et transforme ce dernier en un système de conditionnement. On génère alors involontairement de « l’enseignement programmé » ; l’ordinateur (re)devient une « machine à enseigner » et non le facilitateur d’un « système où l’on apprend ».

Bref, on rêve de Morin ou de Piaget, on se réveille en faisant du Pressey ou du Skinner !


Dans les années 80, Marthe Sansregret spécifiait comment construire un portfolio en vue de faire reconnaître ses acquis. Une telle construction nécessite un lourd travail rétrospectif (des centaines d’heures aux dires de certains) pour, en quelque sorte, matérialiser son bilan de compétences. Il s’agit donc, dans cet esprit, d’établir un curriculum vitae comportant un recueil tangible de « traces » d’apprentissages et de compétences. L’une des motivations d’un tel effort est de se faire reconnaître d’un point de vue académique afin de pouvoir reprendre des études sans « repasser par la case départ ».

Ce souci de disposer de « preuves » de compétence, de validation à perspectives académiques, rejoint tout naturellement notre problématique de l’évaluation des acquis de nos étudiants (les « outputs » de nos dispositifs de formation). Avec cependant une différence : nous nous situons au cœur de la période d’acquisition de connaissances, et non a posteriori.

Dans notre contexte, le portfolio –en particulier dans une déclinaison informatisée– peut alors être appréhendé tout à la fois comme moyen et comme témoin. Et comme notre démarche concerne, et l’individu apprenant, et la collectivité collaborante, il faut envisager le portfolio sous l’angle individuel tout autant que dans une pratique de partage et de confrontation constructive. L’informatique, avec ses outils de communications et de mise en commun d’informations, rend l’instrumentation de ce dernier aspect désormais tout à fait réalisiste.

Nos premières réalisations en la matière s’inscrivent dans le contexte de la formation en alternance de conseillers financiers pour de grands établissements nationaux (Harvey et Lemire 2001). Elles conduisent les étudiants à se constituer une représentation de la nature et des connaissances du monde professionnel auquel ils se destinent. Tableaux de bord informatisés, cartes conceptuelles élaborées en itérations contradictoires, publications sous forme de site Web des résultats obtenus, sont tout à la fois les jalons de la route à parcourir et les traces des activités réalisées. Ces éléments sont ainsi trois grands aspects du ePortfolio proposé à chacun des étudiants de la promotion de cette licence professionnelle, ces derniers pouvant en outre revendiquer la déclinaison collective de ces constituants (Bourriquen-Journay-Lemire 2002).
Sur la base de retours d’expérience de ces activités, nous enrichissons régulièrement depuis 2001 le protocole « FISAD » (Formation Individualisée avec Suivi à Distance). Ce protocole repose en partie comme nous l’indiquions précédemment sur un dispositif de formation comportant leçons et questions de contrôle dispensées par l’ordinateur. Il dispose aussi de tableaux de bord de la progression des apprenants évaluée tant en référence à une planification théorique qu’en référence aux pratiques des autres acteurs de la communauté. Ce protocole spécifie enfin une démarche précise et outillée d’accompagnement individuel de chaque apprenant par une équipe d’experts humains.

L’ePortfolio boîte à outils pour une autonomie des études grâce à une évaluation pour et par l’apprenant

Trois années de pratique révèlent la bonne efficacité du couple « dispositif de formation individualisée en ligne » et « protocole FISAD ». Cette « satisfaction » concerne le niveau de connaissances acquis par chaque apprenant, mais aussi le développement collectif de la compétence d’accompagnement de l’équipe de formateurs.


Nous sommes ainsi maintenant engagés dans la transposition des constituants du protocole FISAD vers « SPIRAL » (http://spiral.univ-lyon1.fr), la plateforme pédagogique WEB de l’université Lyon1. Il s’agit en particulier d’offrir des espaces outillés de connectivité apprenant/connaissances, apprenant/apprenants, apprenant(s)/équipe de formateurs.

Les espaces à construire sont :

- Un espace de travail collaboratif entre les étudiants d’une promotion autour de questions sur leur progression dans l’apprentissage de la bureautique. Cet espace est appréhendé sous la forme d’un forum structuré ;
- Un espace d’accompagnement des travaux des étudiants liés aux projets informatiques qui leur sont imposés ; il s’agit ici de combiner les dimensions d’un tableau de bord d’activités et celles d’un portfolio de réalisations ;
- Un espace de consolidation pour homogénéiser les comportements des acteurs aussi bien étudiants qu’enseignants. Cet espace vise la mise à disposition des ressources de type cours en ligne mais aussi la capitalisation des pratiques pédagogiques.

Cette approche par « l’historisation » collective des connaissances des apprenants et des formateurs ne nous fait pas perdre de vue que ce portfolio public peut et doit être au service du développement personnel. Ainsi sur la base de cette collection d’informations publiques, nous pouvons imaginer une reconstitution de l’apport personnel de chaque acteur dans l’évolution des connaissances du groupe. Cette confrontation de l’individu par rapport au groupe lui permettrait de facto d’évaluer ses connaissances et par la même de gérer son propre processus d’apprentissage.

Conclusion

Dans sa conception originelle, le portfolio est un dossier visant à regrouper les preuves d’apprentissages acquis lors de son activité professionnelle ou, plus largement, au cours de sa vie (ce qui peut naturellement englober la scolarité). Il est constitué pour faire reconnaître ses acquis par une institution d’enseignement ou par un employeur.

Notre approche considère que sa constitution en environnement de formation doit avant tout viser à permettre à l’apprenant, dans une démarche réflexive, de mieux se reconnaître en terme de connaissances et de compétences, qu’elles soient acquises ou en développement. Et cela à la fois à titre d’individuel et en tant qu’acteur au sein
d’une communauté d’apprentissage. Ensuite, en reprenant la formule de J. Aubret citée dans le traité des sciences et des techniques de la Formation (Carré et Caspar1999, p465), il s’agit aussi de « mieux se reconnaître pour se faire reconnaître ». Ce qui au final rejoint alors les préoccupations de dispositifs tels que les blasons des arbres de connaissances (Authier et Lévy 1996)

Outil de connaissance et de reconnaissance pratiqué par chacun des membres d’une communauté au cours des temps de formation, le portfolio, ou plutôt sa version informatisée ePortfolio, apporte à l’apprenant l’aide nécessaire au pilotage de sa progression. Et il apporte à l’évaluateur les éléments nécessaires à la certification. Ces éléments découlent directement de la pratique par l’apprenant du processus de formation et sont ainsi naturellement plus riches et variés que ceux découlant d’exams traditionnels.

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Additional Papers
Using the ePortfolio as a Facilitator for Collaborative Research between Students and Faculty

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Abstract: This paper introduces work in progress related to the “Research on Research” grant program by the Office of Technology Enhanced Learning and Research (TELR) at The Ohio State University. Specifically, the paper describes the e-partnership between an undergraduate student and a professor, and the challenges of designing and constructing a research ePortfolio during the course of the program in the summer of 2004. The objective of the grant was to extend the faculty member’s research into the undergraduate experience by exploring the use of ePortfolios as catalysts.

Keywords: collaborative learning, e-learning, ePortfolio, design research and methods

Research on Research: Student-Faculty e-partnerships

The overall intent of the “Research on Research” project, conducted at The Ohio State University during the summer of 2004, was for undergraduate students to collaborate with interested members of the faculty in order to learn about their ongoing research efforts and to document this process through the design and fabrication of an ePortfolio. Throughout a ten week period the students attended seminars on research practices conducted by a group of participating faculty. Concurrently, students participated in technical workshops to support the development of the ePortfolio which would document the faculty member’s activity.

The specific objectives of the program were twofold: first, to expose the students to research early in their academic careers, thus allowing them to make future choices based on first-hand knowledge and secondly, to provide them with the opportunity to learn about alternative study and career options outside their chosen discipline. For the faculty, this project provided a period of reflection about their own professional development, while providing them with the opportunity to share their agenda with potential research sponsors and other academics inside and outside their own community. For Ohio State University, sponsoring a program around the topic of ePortfolios on research achieved multiple goals, including familiarizing the Ohio State community with the successful use of innovative technologies, while serving as an advising, recruiting, promotional and educational tool for several programs, including First Year Experience, Freshman Orientation, University relations, industry partners and research sponsors.

The first “Research on Research” grant was awarded to ten student-faculty teams during the summer of 2004. The students received a summer stipend, committing to a workload of thirty hours per week during a ten week period. They were provided with state of the art facilities and equipment and technology support staff, in addition to the faculty member’s commitment to involve the student in their research program.

The students were required to participate in weekly seminars covering a variety of subjects from research vocabulary and methodology to research policy. The final outcome of this effort was successful as undergraduates from different fields and backgrounds were given a common ground of understanding about research and academic life as well as learning the rigors of research in their chosen fields while achieving a high level of technical expertise.

Our experience

Our partnership was comprised of an Assistant Professor in Industrial Design and a third-year student in Visual Communication Design. Our project was a bit unusual, in that the topic of the research project was the ePortfolio itself. We examined the
ePortfolio as a means by which to document and communicate one's research and created an ePortfolio to document this research project. At the same time another ePortfolio was developed to apply the research findings.

Professor Gill's research agenda focuses on methods, media and materials by which designers communicate during the design process, and how they impact the communication task. In the case of ePortfolio, media, technology and context were at the forefront of our investigation. We defined the ePortfolio as a design problem, analyzing the context, user, and objectives by applying design methodology to its development. The specific subject was the professor’s academic portfolio and its context.

The student/teacher partnership investigated the format, objective, and audience for the ePortfolio while looking at how technology supports differences in information, users, materials, and contexts. Over the summer, the student participated in all phases of the design process – divergence, transformation and convergence – while considering problem definition, idea generation, solution finding and final development. During the divergence phase, the student conducted a comparative product function analysis in order to define the scope, the goals and boundaries of the project. During the idea generation process, the student generated multiple concepts; the potential solutions were compared and ranked according to how well they solved the problem. During the ePortfolio development phase, the archives of images and assignments were organized and categorized in support of the problem goals. The result was an electronic document that communicates the professor’s teaching portfolio in which the communication task is supported by the media and technology as defined during the initial project phase.

**ePortfolio as a design research subject**

Much has been written about design almost since the time it was recognized as a separate subject worthy of being taught. However, interest in research among the design disciplines has been limited when compared with the sciences, humanities and other disciplines. The quantitative methods of scientific research can’t easily be applied to the design field. Nevertheless, most design methods have inherent structure that deals with specific identifiable procedures during the three phases of design process: divergence, transformation and convergence. *(Figure 1)*

![Figure 1. The Design Process](image)

Introducing the student to this rigorous methodology was the primary objective for the faculty member. The following description is a summary of the student’s approach and conclusions:

**Divergence**

The divergence phase includes defining the specific problem and the objectives for the project. The information and knowledge acquired from doing background research provides clarity and understanding of the specific problem as well as the goals and objectives. This research question was defined as: *How do we support the information in Professor Gill's academic portfolio through an electronic format in order to communicate with specific audiences: students, teachers and potential research sponsors.*
The objectives were identified as follows: i) to provide the user with a functionally sophisticated aesthetic expression without violating usability constraints; ii) to achieve a visually hierarchic system of images over text while maintaining efficient information exchange; iii) to use technology to enhance the meaning of the information presented; and iv) to design two similar yet independent ePortfolios, one to document the design research phase and the other to reflect the application of the research to Professor Gill's academic portfolio.

Several existing ePortfolios were examined and evaluated during this phase. Observations were made regarding the possible users and contexts, communication tasks, as well as identifying the characteristics of the information presented. Some typical characteristics of information include text-based, image-based, timed-based, linear, non-linear, quantitative and qualitative.

The divergence stage includes determining the project scope by identifying project constraints and targeted audiences. For this project we found the constraints to be: i) technology available to the users/teacher/designer; ii) proficiency in technology for the users/teacher/designer; iii) the use of technology to support information; iv) project length—10 weeks; v) format of current documentation.

The users were identified as: i) current and potential design students; ii) faculty members; iii) potential grant funding institutions.

**Transformation and Convergence**

During the transformation phase the pragmatism of the divergence analysis blends with creative innovation. New ideas are developed and explored; although this is categorized as stage two of the process, it often overlaps stage one and three to some extent. A navigational structure was developed based upon the definition and understanding of the problem through the divergence stage. Once the navigational structure was defined, different ways of presenting the navigation within the context of the site design were explored.

We designed the information architecture to explain where different elements would be placed. This method provided us with a structure while allowing the flexibility of moving information around as needed during the design process. The basic wireframe site map also provided an informal to-do list to follow. The goal was to organize the materials in the most logical way, providing many routes to the same content. This allows the user to interact with the information in whatever way he or she chooses. This medium allows us to view information in a nonlinear format, the key being to truly utilize this feature with a good navigation system.

The concepts we chose to explore experimented with how the two ePortfolio sites would look and feel in relationship to one another. (Figures 2 and 3) Elements explored included the color scheme, navigation bar, layout, typography, and the application of a grid system. The objective from the beginning was to create an ePortfolio that visually communicates without heavy textual information, and that uses elements and technology available to enhance the meaning of the information presented.
The dominant element on all pages is a large panoramic image; this image is used to provide support to the content and visual variety to an otherwise color–neutral site. The quotation also serves as a means to pull the user into the information. The hierarchy is placed on the visual information and not the textual information. This needs to be very clear in the teaching results section, which houses visual examples of student work. The work should be allowed to speak for itself, without having textual data distracting from the visual data. The information is presented as a rollover option built into the info button. This allows the user to access the information only if he or she chooses to do so. The main images and text are in the teaching results sections and are never displayed at the same time. This prevents the images and text from competing with each other.

**ePortfolio as a means of communication**

Several existing on-line ePortfolios were studied during the divergence phase of the design process. Observations were made regarding the possible users and contexts and communication tasks, as well as identifying the characteristics of the information presented and the use of technology in support of the intended message. As noted above, different characteristics of information include text-based, image-based, timed-based, linear, non-linear, quantitative and qualitative. Our findings suggest that in addition to technical expertise, there is a need for visual literacy within the ePortfolio community. The computer is a powerful tool for data management, but the communication with the user occurs by visual means, and understanding the effects of images, fonts, colors, and visual hierarchy in the communication task is critical to conveying a clear message.

Images and visual explanations can be used to direct the user through the information in place or in conjunction with text–based format. In many contexts, choosing the desired hierarchy should be an option, since scanning through images can be more effective.

As ePortfolios become available, it is important to consider the individual needs of a variety of possible users. Achievements, skills and goals come in a variety of forms, and ePortfolio technologies should allow the flexibility necessary to support them. Digital media offer possibilities to demonstrate dynamic complex problems that are unique to different academic and professional fields. The computer environment is ideally suited to demonstrate continuity and to clarify relationships. “It is said that computer visualization not only changes how we see phenomena, but also how we think about them. The computer restructures the problem so that the human visual and perception systems may more easily process it.” (Molnar, A. 1997) Technology–based portfolios should not in general be limited to hyperlinked representations of paper-based portfolios.

**ePortfolio as a learning facilitator**

The “Research on Research” program facilitated learning at two primary levels: The students acquired an in depth understanding of research in their individual fields and achieved a high level of technical expertise. The need to acquire technological skills bound the participating students together to work toward a common goal. While the individual research projects were entirely different, everyone needed to gain technical expertise in order to communicate their project in the ePortfolio format. This common goal encouraged students to collaborate in order to share and gain the tools needed while exposing them to each other’s field of study. Without the use of technology for documenting and communicating their project, the student collaboration may have been very limited. They also relied extensively on the program’s staff when they needed help. They formed a community of learners, which was critical in their comfort level as they gave and received assistance.

Another important aspect of the learning experience was the reflective nature of the activity. How it allowed Professor Gill to organize and clarify her research agenda as well as her academic goals.
Future Work

The digital artifacts developed during the course of the project will serve as a framework for future development and achievements for the faculty member and her students. One major change brought about by new ePortfolio technology is the way in which the student’s work is documented. Time-based media is available in the current format and opens new possibilities in which video and audio can contribute to the visual explanations in support of the individual assignments and the faculty member’s body of work.

The two ePortfolios developed during the course of this project will serve as evidence of the depth and breadth of the student understanding of design research and methodology, as well as evidence of design talent and technical expertise. The skills acquired during the “Research on Research” experience will also aid the student with implementing future projects. Most importantly, the knowledge of the design and research processes will assist in the execution of her senior thesis research, as well as preparing her for graduate school. The program also offered the student an inside view of the academic world, providing insight to the prospect of a career in academia. The knowledge gained during the development of “ePortfolios for Communication and Context” will enhance the student’s approach to all future design endeavors not only in the academic environment but also as a design professional.

A direct link to our ePortfolios project results is:
http://digitalunion.osu.edu/r2summer04/davis.1669/research%20site/home.htm

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References

Abstract: As ePortfolios grow in popularity and importance, security will play a progressively larger role in their implementation and delivery. Protecting people’s personal data, restricting viewing to those authorized, and insuring the authenticity of artifacts are all issues that must be addressed before electronic portfolios can take a leading role in the online environment. We present a number of problems that face ePortfolios, as well as potential solutions and experience with some of the same.

Keywords: Security, Assessment, Artifacts, Confidentiality, and Privacy

Introduction

ePortfolios are currently being investigated at Simon Fraser University in Surrey, British Columbia, Canada by the Student Portfolio Architecture and Research Community (SPARC). After some initial research, the team has completed a functional portfolio creation program; however the creation of the tool has brought forth several research opportunities and questions that need solutions. These research directions are in three primary categories: educational, technical and the educational technology.

Background

The SPARC team is in the process of creating a usable tool that provides the portfolio creator with a simple way of creating and maintaining a digital portfolio. Instructors can also use the tool to track an individual’s portfolio creation process and provide feedback and direction in an online environment. Researchers can currently extract data on usage and content with permission given by the portfolio creator. The underlying structure of the tool is suitable for different purposes, currently focusing on the Province of British Columbia’s Ministry of Education’s Portfolio requirements, as well as the SFU Faculty of Applied Science’s foundation year TechOne program’s portfolio assignments.

Educational Research Pathways

As interest in ePortfolios increases, the main impact will be in the field of education. Many different formats and structures for ePortfolios exist, and it is important to choose the right format for different educational settings and goals.

For example, an ePortfolio created for employment purposes will not have the same content as an ePortfolio made for assessment. Using the right type of portfolio in the right setting will bring more educational value to the process, as well as ease the development process of the portfolio.

There are a number of paths a learner could take when creating an ePortfolio. For example, it could be a set of web pages, a text document, or even a weblog. Most current approaches attempt to digitize the process that is used when creating a paper portfolio. Further research in the effectiveness of this and other approaches to ePortfolio creation and management may offer better experiences and more learning benefits.

One of the reasons why portfolios adoption has not occurred throughout educational environments is due to the lack of hard evidence that portfolios have concrete educational benefits. Discovering the educational value of digital portfolios will increase their use in the educational institutions.

Using portfolios as learner assessment can introduce other problems to portfolio creation. More research must be undertaken into what the problems with using portfolios as an assessment tool are, and how best to use digital portfolios for prior learning assessment.
Definitions: Types of Portfolios, Structures, and Impacts on Learning

There is no one single way to create a portfolio; in fact, a multitude of different classes of portfolios have been identified over the years. These range from personal portfolios containing childhood artifacts, to showcase portfolios traditionally used for showcasing to potential employers in the traditional and digital arts; to learning portfolios, tracking how a subject learns over time; and to assessment portfolios, often used in secondary or post-secondary institutions to gauge the caliber of a student's work. (Smith et al. 2003)

To date, however, there have been no attempts to classify the differences between these different portfolio types. For example, what makes a simple learning portfolio different from an assessment portfolio? As well, there are portfolios that cross the boundaries of these classes. With some new portfolio systems, one portfolio may have several different published variants, which allows for a crossover, potentially fulfilling the requirements for one or more of the portfolio types.

The classification of portfolio types and definitions for them would allow researchers to study learning impacts of different classes. For a desired outcome, is one type of portfolio better than other types? Do certain types aid with the development of learning skills, and help students learn more effectively? Without a classification system these are difficult questions to answer.

Development: Explore Development Methods

There is currently no accepted development methodology for portfolios; there are differing opinions as to the best method creating a portfolio. There is also very little published information on these different creation methods.

Research needs to be done on the methods of creating a portfolio (keeping in mind the different types of portfolios) in an attempt to answer certain questions. Does any particular creation method work best for a given portfolio type. Do some encourage more learning during the portfolio process, or do they give better results in assessment portfolios.

The most important question to be answered here: is digitizing the paper portfolio processes the best way to go? There have been a number of proponents of this method, but there is no hard evidence that this is efficient or effective.

Learning: Determine what ePortfolios Teach

While there are many proponents of the idea of reflection – looking back upon what one has learned in order to better understand the learning process and the information garnered – there have been few attempts to discover if it positively impacts learning. Given the high emphasis placed on reflection in many portfolio systems and methods, this is a question that deserves attention.

There has been some research on the subject of reflection, but to date it has been limited to the field of undergraduate medical training; added to this is the fact that what has been published is conflicting, with different studies reporting vastly different results. (Rees et al. 2004; Dornan et al. 2002)

ePortfolios have a potential use as a learning tool, but acceptance of this tool will be predicated upon determining that it has a positive impact on the learning experience, and reflection is an important part of this experience.

Assessment: Identify Fair Assessment Practices for ePortfolios

What are the Impacts of Assessment on Portfolio Development and Learning

As an assessment tool, portfolios show great promise, especially in the digital arena. Their promise lies in being able to give a more balanced, overall view of a subject's learning career, rather than taking 3 hour snapshots (such as exams) to gain
information of the subject's knowledge level in a particular area. Portfolios have the ability to function as a collection of work over a semester, a year, or a career.

As with any assessment tool, however, portfolios are subject to a number of different factors that can influence the creation process. Identification of these different factors and being able to account for them is necessary before portfolios can be accepted as a fairer assessment tool than more traditional methods can be.

The question of whether designating a portfolio as an assessment portfolio can cause the creator to alter the content in the portfolio is particularly interesting.

**How to Best Assess a Portfolio?**

The advantages of exams, tests, and other more traditional methods of assessment are based on the idea of their objectivity. Assessment in portfolios is currently far more subjective that those traditional methods, and as such depends as much upon the assessor as the subject of the portfolio.

**Prior Learning Assessment and Recognition (PLAR)**

The idea of prior learning assessment and recognition is determining a pre-existing skill level in a certain area, and insuring that that skill level can be recognized (Briton et al. 1998). One major example of this is immigrants with a skill level from their previous home nation looking for recognition of their skill level, while many nations will not recognize previously attained certificates from other nations, leaving these individuals – a potentially useful part of the workforce – either forced to repeat their training or find a less skilled source of employment. This leaves a potentially useful part of the labour pool untapped.

There are other applications as well – crediting university courses for transfer between institutions where no transfer policy exists, for instance – that create a merit in further study of the impact and uses ePortfolios may have in the realm of PLAR.

**Technical Research Pathways**

As ePortfolios usage increases, further uses and technical issues will arise. New uses of portfolios may be as simple as matching people with similar interests. More advanced uses would be matching individual portfolios with given criteria in employment databases, or matching people with resources.

Technical issues with ePortfolios such as privacy will arise as well. As online portfolios contain large amounts of personal information, they may become a way for individuals and organizations to harvest data. Necessary precautions must be taken, so only parties that the portfolio was intended for will be able to view it.

From this arises another issue: database security. Systems that allow easy creation and sharing of portfolios aggregate large amounts of personal data and will inevitably attract the attention of hackers and organizations interested in harvesting data. The servers for such services, and their databases in particular, will have to be kept secure, even in the face of successful attacks.

With the growing interest in ePortfolios, there will be number of new programs and services that will aim to ease portfolio creation. It will be important that some standards are established and adopted by the existing systems, so migration between systems is as seamless as possible.

When data are transferred between systems, it may rest directly in the hands of the individual for a period of time. During this time, the content of the portfolio or the artifacts attached to it are vulnerable and may be tampered with before they are imported into a new system. There must be a way of determining whether the portfolio has been tampered with during such transfers.
Expertise Finding

Matching People with Similar Interests

Peer or mentor matching is an approach whereby portfolio creators can be matched up with mentors – whether those are other students, teachers or outside system users – that can help with their development, both personally and of the portfolio.

The SPARC architecture has deliberately been designed as a generic portfolio system, in order to accommodate the greatest number of students in our user groups, and our desire to keep portfolio creation low-effort. One side effect of this is limiting the amount of metadata collected, and in fact, portfolio creators aren’t required to insert any metadata into the system at all.

Metadata is the traditional method of matching up peers and mentors. Without an inherent metadata system, this approach cannot be directly applied to the SPARC system. However, mentor matching is an important possibility in portfolios, and we are continuing research in this area, to see if we can accurately connect students and possible mentors without the need for explicit metadata.

Criteria Based (Industry/Academic Recruiting)

Criteria-based expertise finding is a large challenge in both industry and academia. It should be possible to take a large bank of candidates for positions – either employment or learning positions – and screen them against certain criteria in an attempt to create a set of candidate that may be scrutinized more closely.

Applications for this in industry are numerous; finding internal; external candidates for employment; or determining employees to offer further training to. In academic institutions, this could apply to both employees and potential graduate or undergraduate students.

Matching People With Resources (Learning Objects, Focus Groups)

As learning management systems become more and more prevalent, the use of learning objects – pre-packaged units of learning content that may be studied, either independently, as a stream, or as a series of choices – has grown dramatically. Matching learning objects to students is a current goal of the educational technology field of research.

Traditional learning object suggestions have come from the previous choices of the users, and the system attempts to determine where the student may like to go next from there. With electronic portfolios this isn’t necessarily possible, as the system may have no knowledge of a student’s previous learning object choices. (The system may, should it be integrated within a learning management system. However, most portfolio creation systems are currently used in a stand-alone mode.)

Instead, the team is investigating approaches that harvest data from the portfolio content itself, attempting to make suggestions based on this data. This is more difficult than the previous approach, as data has to be sifted from potentially unrelated information. Portfolios can also be compared on a wide basis to glean information from other individuals whose portfolios may be similar in nature, and infer a potential suggestion from that route.

This has many applications, most notable at the secondary and early undergraduate post-secondary levels. Many students are unsure of what direction they would like to pursue in their academic careers; learning object matching from portfolios may allow suggestions to students looking to gain a broader view of possible education choices before making a decision on a path to follow.

Privacy and Leasing of Information Collected

With the rise of portfolios, they are going to begin to hold large amounts of personal information. This information can be used for many different purposes, including those that may negatively impact the creator of the portfolio.
While this problem is by no means new, portfolios may exacerbate the already growing problem of harvesting of personal data for malicious uses. Security on both published and unpublished versions of portfolios will decrease the likelihood that this information can be used for negative purposes, but public portfolios will be subject to such indiscriminate harvesting.

Alternatively, this data may be used to help the portfolio creator. For example, should the creator choose to take part in a portfolio research project, they may be required to allow others to use some of their information.

The SPARC team takes the view that any data placed into a portfolio belongs to that portfolio's creator (assuming that they had the legal right to the content in the portfolio initially). This allows for the application of a method of leasing private information for positive purposes, and avoiding having the data harvested for negative purposes. We wish to pursue the idea of the “leasing” of information for a certain period of time, for a certain reward, allowing the creator to retain control over their personal information, while allowing them to participate in any online interaction they wish.

Technically, the problem is fairly challenging, and there exists the possibility (in fact, the likelihood) that it is not feasible to create a full implementation of the idea. There may be other barriers within this problem, such as are discussed in (Basho 2000); however, we wish to determine if there is such a possible solution.

**Database Encryption and Security**

Securing personal portfolio information against attacks is vital to people being comfortable confiding in such technology. This security must start where the information is stored. Database storage is used in all ePortfolio systems, and as the central repository for all data, is likely to be a primary target for an attack.

Electronic portfolio systems are vastly different from most traditionally encrypted systems. Most of these are of the “multiple creator/single recipient” variety – while many people can encrypt messages, there is usually only a single intended recipient that can read the message. Portfolios have one or more creators, but usually a far greater number of intended recipients. This presents a problem in the traditional world of cryptography and security.

Exploration is needed in this area to ensure the highest degree of security possible. There is research to be done with regards to security in this area, and ePortfolios may help to push this forward. For a full treatment of the subject of security in digital portfolio systems, please see (Lougheed 2004).

**Integration and Extension of Existing and Future Standards**

Standards are currently under construction for a variety of projects that will affect electronic portfolios. For example, there is the lately finalized IMS Learner Information Package Specification (IMS 2001) and the IEEE Personal and Private Information (Farance 2002) standard currently being drafted, both specifying ways to exchange and package information about students. As well, there are efforts to standardize packaging formats for digital portfolios (IMS 2004).

The team is planning to integrate use of these standards as they develop. As well, as future standards develop around the area of ePortfolios, we will incorporate those. A packaging format will be used primarily in portfolio transfer between systems (Bogyo 2004, Lougheed 2004), while information sharing standards can be used for user modeling and information dispersal.

**Verification of Authenticity**

As ePortfolios become more prevalent, attaching documents or other artifacts generated by other computer based systems, such as a university student information system, will become more common. When applying for a job or further education, it is beneficial to automatically determine if an artifact is authentic. In most cases this is impossible, or at least impractical; we cannot, for instance, determine
whether a portfolio owner did, in fact, create the object depicted in a photograph attached to their portfolio.

Tackling this problem is a difficult task. While it is a simple enough process to digitally sign a document, without user interaction, verification of the signature simply means that someone signed the document. In the case of the system-generated university transcript, for example, we can’t tell if it was the issuing university that signed the document, or whether it was someone else with a key merely identifying himself as the university. There are applications to trust networks and a variety of other ideas that may help solve these problems.

This information becomes important if we are to trust the information contained in online portfolios, and in transferring portfolios between systems.

**Educational Technology Research Pathways**

Using portfolios for assessment is only one of the many applications. ePortfolios can also be used as personal or learning portfolios, or a showcase for job searching.

With the emergence of Semantic Web, a framework aiming at better ways of sharing and re-using data on the web, ePortfolios can serve as a tool for connecting people based on interests, skills, or other criteria if presented in the right way.

Similarly, ePortfolios can be used as learning objects. A portfolio can be learning object, or number of different learning objects can make up a portfolio. The problem that arises when using portfolios as learning objects is the need to describe a portfolio in the existing standards for learning objects specifications, as well as connections to existing systems to allow federated searching.

**Portfolios and the Semantic Web**

One of the many dramatic possibilities with regards to electronic portfolios is the ability to link people together, particularly through common interests, strengths and weaknesses, and particular criteria.

One approach to this ideal that has much in common with expertise finding is connecting portfolios to the semantic web. The semantic web (Berners-Lee 2001) is an in-development extension upon the World Wide Web that allows for systems to dynamically pose queries between systems, and receive an answer to those queries. The advantage to the semantic web as it is envisioned is that systems will not necessarily need to understand the same protocol (speak the same language, so to speak) in order to be able to pose these questions to one another.

This idea has great application to numerous fields, including expertise finding, databases, federated searching, and even every day actions we take. (One of Tim Berners-Lee's primary examples (Berners-Lee 2001) is the desired ability for a personal digital assistant to automatically query a general practitioner’s office and create an appointment time that works for all parties.)

Digital portfolios could be an excellent testing ground for some of these possibilities, and portfolios may well serve to further the expansion and adoption of the semantic web on the part of the user, by providing on-the-fly, automatic creation of semantic annotations.

**Portfolios as Learning Objects**

The idea of learning "objects" is a prevalent one in the online learning environment. Packaging portions of learning content in such a way that they can be absorbed in whole or in part, or as a piece of a stream is a possibility that has been adopted for most eLearning platforms.

Portfolios and learning objects go hand-in-hand. A collection of learning objects can make up part of a portfolio and a portfolio, when used to obtain knowledge from someone else’s experience, can be considered a learning object; the SPARC team has termed these “biographical learning objects".
Questions we would like to answer are: do portfolios fit within these systems, or would it be necessary to extend portions of existing systems to accommodate online portfolios as learning objects? Would specifications such as Dublin Core, IEEE LOM, IMS/ADL SCORM be sufficient for portfolios?

Simon Fraser University has many leaders in the fields of interoperability between distinct learning object repositories, such as in (Hatala et al. 2004). This allows us to leverage existing knowledge in the field to determine how ePortfolio systems might link with existing learning object repositories.

**Dynamic Development of a Portfolio within a Learning Management System**

The interoperability of systems to make the lives of students and instructors easier is always a laudable goal. While many institutions have existing learning management platforms or systems (LMS), as the adoption of electronic portfolio systems increases, it will be necessary for the systems to interact, and by doing do reduce the burden on students.

When learners interact with learning management systems, we see no reason why the work they generate within those systems cannot seamlessly be added to their portfolios. Assignments, feedback, or assessments may be relevant to the learner’s portfolio should be automatically extracted and placed in the student's portfolio awaiting reflection.

We would like to explore the technical viability of this approach, while allowing research to be done about the learning impact. As well, it should be possible to integrate our ePortfolio system with an LMS, to create a central tool that all users can share seamlessly.

**Conclusions**

The Student Portfolio Architecture and Research Community at Simon Fraser University has created an online portfolio creation system as a research base to explore a number of issues impacting the adoption and use of portfolios. We have presented a number of the research directions that the team will be following, in the education, technical, and educational technology areas.

In the education section, we have discussed determining the true strengths of online portfolios, as well as how we might increase their usage throughout secondary and post-secondary institutions. In the technical section, we presented our plans regarding security of data and personal information, expertise finding, and adopting standards. And finally, the educational technology section discussed connections to the semantic web, learning objects and learning management systems.

There are many other online portfolio research projects being undertaken, in both the academic and industrial realms. This paper presents solely the focus of one of these projects, though there may be overlap with other research platforms.

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**References**


Additional Papers


