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Conference papers

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On the move: ePortfolios and new ways of learning

Keynote for ePortfolio 2004, La Rochelle, France Oct 28-29

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Portfolios, as the name suggests are mobile containers (porter = to carry; portable = movable) for artefacts in a range of media, and while everything 'm' is in at present, it is a good time to explore how eportfolios, and their relatives blogs and digital stories, can support learning in a flexible and mobile way.

Leaving the technical aspects to others, I want to focus on some aspects of the new learning environment of the 21st century. It's a world where many people have access to technologies that compress time and space, raising expectations of 24/7 activity overlapping work and leisure, but one that is seemingly divided, even within nations, into those who have knowledge and those who do not: the so-called digital divide.

The knowledge economy

In the 21st century, we talk of knowledge as the new currency, and knowledge building as the work to be done in learning organisations. Knowledge building dates back Dewey's (1910) view of knowledge as a product constructed by people and containing the meaning of objects and events. While knowledge building is activity directed outward towards the creation of knowledge itself, learning is a personal consequence of this process, the aspect that is directed to enhancing individual abilities and dispositions.

Scardamalia and Bereiter and (1999) argue that knowledge itself must be in the world, rather than in the mind. This makes communication essential.

In the knowledge economy, Handy (1989) predicted the rise of portfolio workers: people who know what they offer and build up a portfolio of work rather than a regular job. They are flexible and mobile, and they are lifelong learners. Naturally these portfolio workers need eportfolios to chart their history and communicate their offerings!

This paper looks at just four aspects of new learning for the knowledge economy.

- Engagement with technology
- Representations of identity
- Developing critical multiliteracies
- Focus on mobility

In the next sections I explore these themes and provide some examples from the Australian context.

Engagement with technology

O'Rourke (2001), writing about the Authentic Learning and Digital Portfolios Project of the Australian National Schools Network (ANSN), identified three perspectives of engagement with technology. The first is the technical, actually learning how to use it. The second is the practical or purposeful use such as authoring and expressing ideas, research and organising information to make new connections, and collaborating with others. This is influenced by teachers designing environments and tasks that use technology for active creation rather than passive consumption, often situated in real problem-solving contexts.

In the ANSN Project, students had significant control in the construction of their portfolios and the structure itself provided opportunities for feedback, questioning and reflection, ensuring that assessment was conducted with students rather than on them. (A DVD of this project will be released later this year).

The third perspective on engagement with technology is a critical one, and has been discussed by the New London Group (1996) and Cope and Kalantzis (2001) in their writing on multiliteracies.
Developing critical multiliteracies

‘Multiliteracies’ is a term that acknowledges cultural and linguistic diversity and the communication opportunities of new media. Those who are multiliterate can express themselves and make sense of the world through multiple modes: linguistic, visual, audio, gestural and so on. Further, they understand and control the media themselves so they can make informed decisions. At this level, people critique the content, the effectiveness of the communication modes they have chosen to use, and their appropriateness for particular audiences. They can ‘read the world’. Developing ePortfolios for a range of situations, rather than a ‘one size fits all’ approach, clearly supports multiliteracies.

Students in a group of regular schools in Melbourne are writing bi-lingual digital stories for students at the Victorian School for the Deaf. The languages are AUSLAN, the Australian Sign Language, which is of course completely visual, and English, which is in this case the second language for the audience. A narration is recorded and played in English, while subtitles and signing are shown through a split-screen technique. Although resource-intensive, this project clearly bridges social and linguistic divides.

It is clear that multiliteracies underpin eportfolio development for all, but it is not yet clear whether some audiences value these sufficiently. Assessment of multiliteracies themselves is still in its infancy, but it being tackled by various education systems in Australia. In addition, making judgments about the quality and value of eportfolio content is likely to be of concern to assessors and employers alike.

Representations of identity

Cope and Kalantzis (2001) state that the presentation of self and culture across a range of media are central elements in the new economy, while Wenger (1998) argues that the purpose of education is to create identities. Digital stories and eportfolios are ideal forms for reflecting on and presenting the multiple identities of individuals and the collective identities of cultural, social and work groups.

In indigenous communities in Australia, where oral communication is the tradition, it is problematic to use video clips in training materials, as it is not appropriate to show images of any one who has recently died. But with the development of appropriate avatars (3D cartoon-like personifications) who speak local community languages, this problem can be overcome. For these communities, this is a very new way of learning.

The Northern Territory Government is using the award-winning MARVIN software work with communities to promote health and education messages in remote locations. The community ownership of the ideas, and their sensitive representation, helps preserve a sense of community identity. However the cost of producing even one avatar or character means this method is not yet widely used.

Focus on mobility

Australians are conscious of distance, both within and outside the country. It makes sense then to have a means of communicating rich information about skills and achievements to potential employers around the world. I know of several young Australians who have taken the initiative to use digital portfolios as a ‘cold calling’ and job application tool, leading to employment in countries like Japan, New Zealand and England.

The Victorian TAFE (vocational) sector launched its ePortfolio site in September 2004, for staff and students, with private and public spaces for storing, manipulating and sharing information. A member can invite others into a group space for collaborative activity, and publish content to the Web. This site provides a statewide learning technology service, no matter what vocational provider a member is enrolled with.

Similarly, several Australian universities are developing portfolios for students as a bridge to employment. Queensland University of Technology (QUT) has been trialling portfolios in 2004 and next year will offer 40000 students the opportunity to create
their portfolio online. Students are encouraged to record, reflect on, catalogue, retrieve and artefacts representing their life within and outside the university.

My recent research considers how mobile devices can support eportfolio development and digital storytelling. It is based on a handset containing a megapixel camera, up to ten minutes video recording, phone, internet capability, 8MB memory and numerous other features. Some would call it a mobile phone. But there is an added feature that could support rich new ways or learning.

Recognising the importance of collecting evidence on the move (the archive), revisiting the artefacts, reflecting on them individually and holistically, and sharing the important items with others, Nokia came up with the concept of Lifeblog. This software can be used to transfer images, videoclips (up to 10 minutes long) and messages from the handset to a personal computer. These are displayed in chronological order, with the date, to give a story of the day’s activities and messages. This element, the Timeline, is similar to the archive, or collection of artefacts. A second feature of the software is called Favourites, allowing us to drag and drop particular items into another layer, and to transfer them back to the handset for sharing with others. With the software we can also add text notes, send artefacts as email attachments, or delete them completely.

During the past few months, the handset was sent out with ten explorers ranging in age from five years to nearly fifty, and on their return they shared interesting and useful data.

Some participants used the device to collect happy memories for the future: for example, as one woman reflected “I love the capturing… but only for good things. My aunt died and I had no interest in taking pictures of anything around that.” And she deleted the clip of her choir singing “because it sounded shocking but we actually sounded very good”. An eight year old chose to save as a Favourite a video clip of his first ride on a horse “because it was the first time” and “you can keep it all your life”. As he composed his text notes, he explained that he was writing for “people in the family”, indicating his sense of audience.

The father of an autistic child was excited that the mobile device could support social stories, a method described by Gray and White (2002) and used extensively by this family.

Say you’re going on a trip to Sydney and they’ve never been on a trip. They can’t conceptualise it, Can’t get over the fact that they’re not going to be in their own bed. You can tell them a hundred times it’s for two days, but they think it’s for ever. So you make them a little social story. It really relieves the stress.

Normally the parents sketch elements of the story and, using the child as the central character, outline the steps involved in going shopping, to the dentist, or on a long trip. With the capacity for ten-minute videoclips, this father saw the device as a ready-made story generator using his child as the actor and the audience.

The handset also went out with building apprentices as a tool for onsite assessment. In fact, tradespeople are early adopters of mobile technologies, so the teacher of building studies saw the potential for the collection of evidence of competence, and digital storage to replace the copious paperwork. One employer used the video feature to capture the house framing completed by his apprentice, narrating as he panned around the site. He preferred the digital device for several reasons. First, it was easy to find. As with most builders, he normally keeps the assessment paperwork in his vehicle to keep it from getting dirty, but his mobile device is always to hand. Secondly, it was easy to use, and thirdly it increased his literacy options. As he was not confident with written English, he felt that making a video clip took the pressure off having to write on paper.

The Lifeblog software is in its early days, and is limited in use, but the focus of this research was not on usability as much as generating ideas for new ways of living and learning by giving people access to a new tool and the freedom to use it as they wished.
Both new ways of learning and the elements of eportfolio development emerged from these explorations. Individual, portable devices to hand could be the new pen and paper for a multiliterate society. The benefits of archiving evidence of experiences, selection and reflection are augmented by anticipation in the case of the autistic child. Situated learning and authentic assessment are integrated into the apprentice’s paid work.

Conclusions and Challenges

It is clear that eportfolios can be an important part of the new ways of learning, and I am sure that many of you are already committed to one version or another along the spectrum that includes eportfolios, blogs and digital stories. Since eportfolios are expressions of identity, the use of tools and languages developed through these related projects are excellent precursors to portfolio development.

As a communication tool, eportfolios need an audience. Who cares? How do we help our audiences learn more about eportfolios as expressions of identity and how to make judgements about them? While some graduate recruiters are keen to receive graduate eportfolios, a recent Australian research study (Leece, 2004) found that only 10% of employers had heard of portfolios, 28% would consider using them for graduate recruitment, and most had not noticed any increase in their use.

If we have a vision for all to have access to the tools required, as this conference suggests, we are setting ourselves high targets, particularly in crossing the digital divide. We have many of the tools to do it, but do we have the will? While the mobile phone is becoming a ubiquitous computer, at the local level many schools ban their use. Will those who cannot hear, cannot see or cannot afford the technologies, be allowed to become truly multiliterate?

Will the infrastructure be put in place? While many geographically smaller nations leap into the 21st century, Australia is still discussing broadband access across the country and the ownership of its telecommunications infrastructure, and there are many such issues in the developing world. Meanwhile the cost of creating one avatar for the indigenous project is $AUD10,000, miniscule compared with the cost of waging war for a day.

So after we have shared and celebrated our progress in this conference, and debated the value of the various software tools, we should ask ourselves: Do we really mean all people should have the opportunity to create eportfolios? If we do, allons mes amis! Let’s get moving!

Acknowledgements

Christian Lindholm and Charlie Schick of Nokia (Finland) provided a Nokia 7610 handset for my research, which was part of the Australian Research Council Linkage Grant LP0347459 with Novell and my colleagues Jennie Carroll and Steve Howard (The University of Melbourne), John Murphy (Novell) and Graeme Shanks (Monash University).

References

Keynote


PS1
Towards ePortfolio interoperability
E-portfolio systems supporting learning and Personal Development Planning

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E-portfolio systems are closely related to systems for personal development planning (PDP), such as LUSID, which structure and support reflective learning. The WS4RL project is defining and prototyping a second-generation standards-based PDP web service, from whose architecture emerges the concept of PIADS, a personal information aggregation and distribution service, which could be central to future e-portfolios. The SPWS project is taking up the challenge of defining frameworks for skills to be used in PDP and with e-portfolios.

Uses of e-portfolio systems

It is possible to classify the information held by e-portfolio systems; the range of functionality offered by those systems, and the uses to which such systems are put. Classification by use is one of the most common and helpful ways to classify such systems. The general use of e-portfolios as tools to assemble and present personal evidence of achievement, knowledge, skill or competence to multiple audiences is well known and documented, particularly in America. This covers both assessment, where the audience may be a particular group of examiners who require to see the e-portfolio, and more general presentation, where the intended audience is wider, and may include potential employers, colleagues, partners, or employees.

There is a related but distinct aspect of e-portfolio use, which is to support learning and personal development planning (PDP) itself. This is naturally based on the same eportfolio information, but used in a different way. A key process in PDP is reflection, and to support reflection effectively, the learner needs to be given opportunities both to reflect, and to record reflection in words. Other people, perhaps mentors or tutors, need to be able to give feedback on the learner’s work and on the learner’s reflections on that work.

While this process can proceed without particular structure or formality, it is generally recognised that there is value in making it a “structured and supported” process – supported by the institution, company or other body which is responsible for helping the learner with their learning.

With an e-portfolio designed primarily as a personal repository, it is not obvious how reflective learning and PDP are to be supported. The question is then, what facilities, functionality or services need to be included in an e-portfolio in order to support these kinds of structured learning.

Supporting reflective learning and PDP

Going beyond the services needed for e-portfolio assessment and presentation, other stakeholders who may have needs to take into account in learning and PDP include both groups of learners and tutors or mentors. In order to serve the needs of these stakeholders, there needs to be some explicitness in the structuring of the educational activity, in the same way that the structure of learning activities can be made explicit in order to be included in a Virtual Learning Environment (VLE). Indeed, PDP, which involves reflection on learning and achievement, is conceived of as a “structured and supported process”, so structuring is clearly highly significant. In the now often-quoted definition held by the QAA in the UK, PDP is “a structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development”. (http://www.qaa.ac.uk/crntwork/progfileHE/contents.htm)

The (first generation) web-based PDP tool designed at the University of Liverpool, LUSID, (http://lusid.liv.ac.uk/ originally designed and developed by the authors beginning in 1997) does not offer much e-portfolio functionality, but is instead designed specifically to support PDP and to hold related records. The XML language used in LUSID can be written to allow designers of PDP programmes to generate
practically any web page for the learner to use, involving the use of those same PDP records. The way that the records are linked up in the database means that there are many opportunities to present the learner with their own input, structured in a way that encourages reflection.

The value of LUSID is to help learners:

- understand what the skills are;
- analyse whether they have actually used a skill;
- understand the level at which they have the skill;
- understand how they can demonstrate to someone else that they have that skill.

We recognised that we had not formally defined the processes which we intended LUSID to support, and to do this we would need to make the structure of those processes more explicit. In the WS4RL project\(^1\), we have explored this by creating an example of the structure of a typical episode of reflective learning that is recognisable as PDP, and we have represented this formally using UML. This potentially involves a mentor or tutor role as well as the learner role. Other roles are significant in the action, but do not necessarily play a part in the PDP process. Figure 1 shows a provisional UML diagram that we have worked with.

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\(^1\) [http://www.jisc.ac.uk/index.cfm?name=ws4rl](http://www.jisc.ac.uk/index.cfm?name=ws4rl) and [http://www.cetis.ac.uk:8080/frameworks/learning_domain_services/personal_development_management/ws4rl/](http://www.cetis.ac.uk:8080/frameworks/learning_domain_services/personal_development_management/ws4rl/)
A possible next step is to represent the process in terms of a specific formalism. In this case we have done this in terms of IMS Learning Design (LD, see http://www.imsglobal.org/learningdesign/), which is intended for representing the structuring and co-ordination of learning activities involving one or more people and systems. However, LD is not intended to give the finest details of the PDP content offered. We use LD only to refer to, not to detail fully, activities which up to now, in have been sent as HTML pages. A typical page in LUSID might present some information, which had been previously gathered and stored in LUSID's database; and structure this into a useful opportunity for the learner to reflect and add reflective comments, which are then added to LUSID's database.
The following step is much bolder and less immediately obvious. We wanted to broaden the reach of LUSID, from being a stand-alone PDP system to offering PDP services more widely. The projects in which we are doing this assume that PDP is to be offered as a web service returning not just HTML pages, which by their nature are rather constrained in their use, but some more generally usable XML structures. Our conception of delivering PDP as a web service involves the use of IMS LIP (see http://www.imsglobal.org/profiles/similar to the draft UKLeaP, BS 8788) and LD specifications.

Putting many threads of thinking together, we came to the recognition that a PDP web service was best thought of in the context of related services, as illustrated in Figure 2.

This arrangement is based on the insight which comes from e-portfolio thinking, that the same information which is used to support PDP also can support other activities and services. Furthermore, we have learned from experience that this information may not be held in one place, but instead be distributed around various physical stores. For example, many UK educational institutions have basic information about students held in a student record system, which is administered officially by the institution, while at the same time other PDP-related information is held by a separate PDP system controlled by the student. We envisage this kind of arrangement being more widespread in the future, where for example some information relevant both to e-portfolio and to PDP may be held on a system provided by an employer.

Figure 2: Components and information flows in the envisaged architecture

In this arrangement of distributed storage, it is still vital to give the individual control over how their information is managed, and we conceive this role of a central place to manage the distributed information being filled by a “personal information aggregation and distribution service”, or PIADS.

The PIADS concept is positioned to perform a central role for e-portfolio functionality. It allows individuals to access their information, wherever stored, and control access by other people. The PDP service does not have to act as a personal database, because that function is taken over by the PIADS, and can focus on providing structure and content for PDP activities.

We also envisage the provision of a web service to designers of PDP activities (or, in due course, other e-learning designers), for them to search around the Web for whatever kind of learning or PDP suits their programme. In principle, this means that in the future, educational content builders and designers will be able to share their designs, not only for straightforward e-learning activities, but also for the reflective extensions to learning that we know under the heading of PDP. This makes more feasible the idea of support for truly personal learning, in an environment that is suited to the learner, and is not necessarily classroom-based.

When a learner has undertaken these activities, he or she may well want to store the outputs, be they personal or group assignments completed, or reflections and commentary on that work: their own, or from peers, mentors or tutors. The e-portfolio approach is well-suited for storing these kinds of artefacts. One aspect which is seen as increasingly important to show in an e-portfolio is the way in which particular skills and competencies can be evidenced, not only by qualifications, but by other achievements and experiences or activities. And from a PDP point of view, the records can be presented to the learner in combinations designed to stimulate further reflection.

If the e-portfolio effectively covers evidence for skills, then it becomes possible that employers, for instance, could draw up a skills requirement list, and send that to a web service to find what evidence is in the e-portfolio of particular individuals, given of course that the individuals had given permission for this.

Skills and the SPWS project

However, there is currently a problem with displaying evidence for skills. That is, that there are many different ways of categorising skills and competence, and evidence for one set of skills does not automatically transfer to evidence for a different set,
PS1 - Towards ePortfolio interoperability

conceived differently. Thus a vital further piece of work needs to be done, to explore
the nature of frameworks of skill and competence, so that eventually we can all work
towards not some uniform description of skills, which is rather implausible, but a
method of relating skills together, based on the lower-level components into which
most skills can be decomposed. This relates to other work in the area of learning
outcomes (e.g. note¹).

This area of skills definitions, in turn, potentially has Web Services associated with it.
In the SPWS project (Skills Profiling Web Service – see web sites²) we are proposing
to represent skills and skill frameworks starting with the IMS RDCEO specification³,
while distinguishing the separate roles played on the one hand by skills or
competencies as concepts, and on the other hand by skills or competencies as
defined for teaching, learning and assessment.

The overall vision we are seeking to advance would see the possibility of e-learning
and reflective PDP integrated and shared, so that the best designs can be widely
distributed individuals who are hoping to be their employees, students, partners, or
even citizens.

Vital to this vision is the interoperability both of the learning designs, and of the skill
frameworks. This will be underpinned by interoperability specifications and
standards, but these will only be able to be agreed in a workable form as we discover
more about the real scenarios of use, which will in turn only come about by extending
the kind of exploratory work we are undertaking.

¹ www.ldu.leeds.ac.uk/l&bulletin/issue4/Robleyandmurd checkout.htm
learning_domain_services/personal_development_management/spws
³ http://www.imsglobal.org/competencies/
ePortfolio Systems Serving Multiple Clientele

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Abstract: The overall objective of our research group is to design an electronic portfolio system that will accommodate the needs of all our users and be easily adaptable and scalable for future applications. We are accomplishing this by looking at all resources and solutions as well as pursuing a set of development strategies. This paper will look at the issues we have identified that need to be addressed for our user groups and will discuss our solutions and their relative effectiveness.

Keywords: Portfolio Systems, Architectures, Client Groups, and Development

Introduction

As electronic portfolios continue to grow in popularity in the future, we will see more projects that must meet the demands of very diverse and disparate groups of users. These groups come from education and industry, as well as crossing over the two, such as co-operative education programs.

In this paper we will discuss the evolution of an ePortfolio system called SPARC – the Student Portfolio Architecture and Research Community – from an initial consultation with user groups to the development of a homegrown ePortfolio system supporting this wide range of groups.

Our team has designed 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, as well as Simon Fraser University's (SFU) Faculty of Applied Science's foundational year TechOne portfolio.

Section 2 will present the background of the various user groups the SPARC group serves and their requirements in a portfolio system. Section 3 presents our view of basic technical requirements for a portfolio application, and Section 4 examines current tools. The architecture the team has settled on is discussed in Section 5, and the SPARC system’s adherence to this architecture in Section 6. We then discuss our future directions.

Background

At SFU we have several groups using ePortfolios in very different ways. If a tool is to be used by the institution it needs to satisfy the needs all of these groups. The following is a discussion of the current groups using ePortfolios, their need for an ePortfolio tool and the type of portfolios they will be primarily producing.

Secondary School Requirements

In British Columbia (Canada) the Ministry of Education has introduced a requirement that every student must create a portfolio prior to graduation. This portfolio is highly specified in what it must contain and how it should be organized. It is required that the portfolio be developed over the final three years of secondary school and is mandatory for graduation. 2004 is the first year the province has implemented the new graduation portfolio program and the first students will graduate with portfolios in 2007. (Government of BC 2004)

While it is not specified what format the portfolio must take – paper-based or digital – a major problem in this curricular change is that there is no associated class time to designate to the portfolio. ePortfolios have become a seductive solution to the
problem for several reasons. First, students must develop the portfolio on their own, with little instructor guidance, and second, because school districts have no desire to keep students from graduating because “they forgot” about the portfolio requirement, an all too possible outcome with no instruction time.

For British Columbia students, their graduation portfolio is an example of an assessment portfolio. However, any student who takes their portfolio beyond the criteria might be producing a showcase or reflective portfolio.

**Cooperative Education (Coop) Requirements**

For some time now, to obtain a job in traditional or digital arts it is required that an applicant present a portfolio of original work during their interview. In other fields, producing a portfolio during the application process is a sign of personal development and enthusiasm. (SFU 2004). In order to apply for a job most organizations require a resume or curriculum vitae (CV), while others request proof that you can do the things you claim. A professional ePortfolio can provide that proof.

The Coop program at SFU wants to provide its students with a portfolio tool to help them create a professional portfolio, that should cover all the things a resume or CV covers and be accessible to the public via the Internet. The technical skills of the users will be varied and thus the tool must be able to accommodate a range of users from the most basic to the very advanced.

**TechOne Program Requirements**

TechOne is a common first year program for students entering Applied Science programs at SFU. In one foundational course students are required to build an ePortfolio comprised of artifacts taken from all their courses throughout their entire year in the program. The technical skills of the students are again varied.

The goal of the TechOne ePortfolio is to facilitate critical and creative reflection on educational and work experiences, facilitate career transition and increase marketability, facilitate identification of personal and professional goals, and enhance the student’s awareness of the relevance of teamwork, effective communication skills, and reflective practice. A portfolio tool is needed because of the variety of technical skill the students in the program have, ranging from very little to expert levels. In order to achieve the educational goals of the ePortfolio development, the technical barrier must be removed.

The portfolio developed in this situation can be classified as part reflective, part professional, part goal-oriented and part assessment.

**Faculty Requirements**

Many faculty members already have teaching and professional portfolios; however, few keep them updated. In a small survey of SFU faculty, the necessary technical skills and amount of time required to produce a portfolio were identified as the major barriers for instructors for producing and maintaining an ePortfolio. An easy-to-use tool that could create and maintain an ePortfolio may satisfy this group.

The type of portfolio created by this user group could be considered a professional or showcase portfolio.

**Undefined and Evolving Requirements**

The stakeholders in an ePortfolio tool may not be limited to these groups. Other groups such as the Faculties of Education, Business and Science each find the notion of ePortfolios intriguing, and each would have very different demands from an ePortfolio tool. As individuals and groups become more comfortable with portfolio creation and maintenance and their respective impacts on education, more groups needing ePortfolio support may arise.

In British Columbia, as all secondary school graduates will have a portfolio, post-secondary institutions may require portfolios to be submitted in the application process (for assessment of prior learning experiences). Interoperability then
becomes important. Finally, there are industry and research groups currently pursuing standards in the areas of structure and security for ePortfolios, and any tool must be able to have these standards easily integrated. It is essential that an ePortfolio tool be designed with these issues in mind.

System Requirements

There are several requirements that can be derived from these user scenarios that are a good basis against which to compare existing ePortfolio tools.

General Issues Identified

Within our user groups the largest barrier to ePortfolio creation is technical skill, while the second largest is the upfront design required. Without a tool to mitigate these effects, the TechOne students used Dreamweaver, Flash, FrontPage, or PowerPoint to create their ePortfolios. For non-technically inclined users there was a steep up-front learning curve that had to be overcome before content building could begin.

However, this desire to have an ePortfolio evolve with the user over time is strong; however this presents a problem when choosing an ePortfolio tool as some users may have more than one use when creating an ePortfolio. This means an effective tool must be able to handle a learning portfolio and a showcase portfolio at the same time. Furthermore, the tool must interoperate with the other systems the user must use, such as a learning management system or an account management system.

Finally, each user group has their own way of tackling an ePortfolio. The TechOne group needs a repository to store artifacts throughout the year, and then later go back, classify them and reflect upon them. The Ministry of Education has specified a very strict order and categorization of the portfolio content. The ePortfolio tool must be open enough to allow for different categories to be defined but also allowing presets.

For the purposes of research, being able to collect and track via metadata would be useful. However, when requiring metadata, there is a loss in usability and a loss in versatility of the tool. Therefore, until users are comfortable with using ePortfolios and processes of development are captured, requiring metadata will be at a substantial loss to usability.

Scalability

SFU recently went through an institution wide upgrade to new student information and financials systems. Because of the bumps that were experienced throughout this change, there is notable hesitance toward rapid and large-scale change in software systems. Larger scale adoption of ePortfolios may be achieved by implementing a solution on a need-by-need basis.

Implementing smaller systems for a school or faculty or a research project would be beneficial for encouraging acceptance. In the case of secondary schools, a separate install of the software and their own server is required. This is primarily due to restrictions and legal obligations on information about children categorized as minors. With research projects, researchers may have funds for their own server space that they would like to use and control themselves, further insulating students who are not participating in the research from potential problems.

It will be necessary for a system to be capable of multiple installs on different servers and sending information between the installs, as well as being capable of moving in to a central system. Some client groups will be rather small with very little money while others will be rather large. The database used to drive the back end must be interchangeable between PostgreSQL (a free, open source solution), IBM DB2, and Oracle at the very least. In the current situation at SFU, while Oracle may be the best back-end for research, (due to liberal licensing for research and development purposes) there are production systems that use IBM DB2 servers already implemented, and cost-efficiency may dictate DB2's use.
Interoperability

Achieving seamless integration with other educational tools is key in the success of an ePortfolio program. (Lifia 2004) In the TechOne program students use a learning management system, their institution provided file space, and several conferencing systems exist. While SFU works towards a centralized solution for these online tools, it is expected that several institutions have similar problems. Any ePortfolio tool must be capable of integrating with the existing tools in a seamless fashion.

As an ePortfolio has the ability to collect massive amounts of information on a particular user’s experience, an ePortfolio tool should also provide a mechanism to create and export user or student models.

Usability

Key elements in usability are minimal upfront effort, minimal effort required in maintain and evolving, ability to be made highly personal, and the ability to accommodate to users with basic technological skills, while at the same time not constraining those with advanced skills. Users cite Blogger (www.blogger.com) and Wiki (http://c2.com/cgi/wiki?WikiWikiWeb) technologies as being ideal in their level of ease to use while allowing enough personal freedom.

The user groups were split when it came to a “guided” portfolio experience or an unguided one. A guided experience would show the users in which order steps needed to be performed in order to create a high-quality ePortfolio. The non-guided advocates make the point that not enough is known about ePortfolio creation methods to provide a guided experience, and if research were to be done on this topic, a tool should not bias the results so heavily.

Research Data Extracted

Self-regulated learning is a particular topic of interest to researchers. Capturing the process students used in creating an ePortfolio and then mapping it to their strengths and weaknesses in traditional academics would be beneficial. Other less directly related research examines user modeling. There are also indirectly related research projects into user modeling and delivery of learning objects. Since ePortfolios have the ability to capture the student's interests, strengths, weaknesses, and other attributes, they become applicable to any research that contains a “personalization” model.

A tool's focus on research needs to be evaluated with respect to any possible loss in usability resulting from the different focus. The easiest way to obtain general data about the content contained in the system is through metadata requirements; however, this restricts the users and can reduce the likelihood users may use the system.

Any tool selected for an ePortfolio initiative needs to both provide the user with exactly what they are looking for (for high participation rates) and provide the researcher with enough information to draw supported, unbiased conclusions.

Integration with Existing/Upcoming Standards

ePortfolio standards have still yet to be produced but are expected to arise to time. Any ePortfolio tool must be modified to be able to comply with these standards. As well an ePortfolio tool must be able to interface with, interoperate with, or integrate with other e-learning technology the institution uses. These may include the IMS Learner Information Package Specification (LIPS), IEEE Personal and Private Information evolving standard, Sakai, Sharable Content Object Reference Model for sharing learning objects, and others.

Adaptability

ePortfolio usage and research is still in its infancy, but as more information becomes available and more groups become involved the more things portfolios will evolve, thus any tool created or used must reflect this attitude and be easily adapted.
Adaptations may take the form of features, methods of creation, standards, research data extraction etc. ePortfolio architecture must be open and modular enough to allow the tool to evolve as the field does too.

From a technical perspective, the ability to change backend databases and even entire underlying operating systems must be possible; the tool cannot be tied to a particular platform. A contract with IBM or other systems that require DB2 may necessitate the use with DB2, however a research group may need Oracle, and a smaller group may not have any money and need a database like PostgreSQL. Changes on this level must be possible.

Tools

Commercial solutions like iWebfolio, TaskStream, Chalk and Wire, and ePortaro are few of the commercial solutions available. Some of our user groups had problems with commercial solutions related to research and integration with upcoming standards. The next major difficulty user groups has is the cost of these solutions. While most provide a usable tool for the community, they lack the flexibility inherent in an open source solution. Because we cannot accurately predict our users needs when it comes to ePortfolios, tying ourselves to a commercial solution at this point would be risky.

The Open Source Portfolio Initiative is currently the largest open source ePortfolio initiative. While the tool it provides is excellent for some of the university requirements, it will not fit with the highly specified criteria of secondary schools. With some exploration of the source our research team was not certain that OSPI version 1.5 could be massaged to work for all of our groups.

Our team has found a gap in the coverage of existing tools. While there are tools for elementary programs, secondary programs and university programs, there are very few that can accommodate both secondary programs and university programs in the way the Ministry of Education in BC and SFU envision using ePortfolios. Given our groups’ needs for a very general ePortfolio solution, it was decided that building our one, whether interim or long-term, was the correct approach.

Architecture Required

From all the requirements of the interest groups and various readings we found that an ePortfolio system that supports all requirements would have the following architecture
**Users**

The system must be two levels of users: portfolio authors and mentors. 

Portfolio authors create the portfolio. We do not want to limit creation to a single person as a group (such as a research team) may develop a group portfolio. Mentors are those who can provide feedback on portfolios. In some cases portfolio authors may also be mentors. The interaction between portfolio authors and mentors is described in discourse.

For our user groups this solution is perfect: it satisfies a general usable tool not associated with any course while also providing a mechanism for the traditional teacher-student hierarchy. Within assessment portfolios and particularly the secondary school graduation portfolio, there are concerns with peers being able to see and comment on each other’s work and privacy needs to be employed. Within the system, we need to be able to have control over which authors can also be mentors.

**ePortfolio Content**

The content contains the entire author’s generated work towards their portfolio.

**Categories**

Portfolios are typically separated into sections, and thus it follows that ePortfolios should as well. These categories can also have sub-categories and sub-sub-categories ad infinitum. Since we cannot intelligently predict the deepest tree structure used in a portfolio, thus the ePortfolio system should not constrain it.

Our user groups have very different requirements for what categories or topics their ePortfolios need to cover. Some are highly specified others are very open. To accommodate both solutions the system has a way of allowing preset categories while not requiring the use of the presets so all the user groups are satisfied.

**Fields**

Within the portfolios we have studied each portfolio category contains a reflection, summary or justification. Sometimes they contain all three, sometimes they contain a description of the artifact and sometimes they are simply a collection of artifacts. We have termed anything written outside of an artifact a field. A field may be directly related to an artifact, it may be simply an introduction to the category, or it may not be there at all. In short, not enough is known these categories, thus an ePortfolio system should provide flexibility.

Similar to categories, each user group has different needs for fields in the portfolio. Some feel that an ePortfolio should be analogous to an accordion folder, where artifacts are simply categorized, and no reflection or description is necessary. Others think that for every artifact a reflection is required. An ePortfolio that does not require fields to be filled out with respect to the category or artifact, but still provide the functionality would satisfy all our users.

**Artifacts**

Integral to ePortfolios are artifacts; proof of the author’s work, skills, interest, or knowledge the portfolio may be focusing on. An artifact in an ePortfolio system can be anything digital. Preferably, an ePortfolio system will be able to handle any type of artifact from a simple URL to an executable file created by the author.

Storage is the primary issue constraining artifacts. We are assuming infinite storage for the artifacts and allowing size constraints to be placed based on the installation set up and requirements. Within our user groups there are two very different approaches of building an ePortfolio. One group begins with a collection of artifacts, reflects upon each artifact and then organizes them based on learning outcomes.
(usually similar to learned skills, knowledge and acquired abilities). Other groups use ePortfolios as a goal setter, where students write out what they hope to achieve in the year and then add artifacts as they arise and are found applicable. Allowing users to create their portfolio starting with the artifacts must be an option to satisfy all of our user groups.

**Portfolio Profiles**

Portfolio profiles are more complex. While the content of the portfolio takes the form of categories, fields, and artifacts, the portfolio profile covers what type of portfolio the author is creating. If all or some of the portfolio content is to be produced as a complete professional and public portfolio, then the particulars of that can be defined and classified as part of the portfolio profile. We want users to be able to create multiple types of portfolios while not having to have separate accounts for each. The portfolio profile created contains all or a subsection of categories, fields and artifacts, whether or not the profile is public, how it should be published and to where.

It is not necessary to have a templating system; however, to accommodate a wide variety of users with differing technical skills, a templating system might be useful. Blogger is the standard identified by students for how users with a variety of levels of technical skill call all use one html generator while not feeling confused or constrained. For our users, accommodating differing levels of technical skills is a priority.

**Discourse**

While discourse is not required by all users, most want it as a feature that they can employ as they see fit.

**Feedback**

Within the traditional teacher-student hierarchy, feedback occurs in only one direction. More modern approaches allow feedback to go in both directions. Through self-directed studies students may create their own portfolio with no teacher overseeing them, in which case peer feedback may be required. ePortfolios are not limited to an academic domain, and thus industry and other stakeholders in instruction need to be able to supply feedback. Anyone within the scope of the ePortfolio system who can give feedback is considered a mentor. However, who is a mentor and the nature of the feedback cycle is dependant upon the ePortfolio initiative.

Within our user groups, some want peer mentors and others want absolutely no peer mentoring. Allowing users to specify whether or not others can view their portfolios is one feature that an ePortfolio tool needs to have. In some instances we have mentors who are not portfolio authors but do want to provide feedback. An ePortfolio tool must address each of these cases for it to work for our users.

**Announcements and Cohorts**

This is primarily a requirement for ePortfolio communities. A central repository of announcements that are made about a topic to a group of users is a necessity for those not co-located. Secondly, a mentor may have several people to track, requiring them to arbitrarily group authors. This way mentors can make group announcements, such as the time they will be available in person to discuss their ePortfolios.

**Plug-ins**

It is extremely important within our community that ePortfolios are not another stand-alone eLearning tool. ePortfolios must integrate seamlessly with other eLearning tools. For assessment portfolios, most want to be able to use their standard assessment tacking or grade tracking tools and simply have ePortfolios work with it. It is duplication of effort for students who submit an assignment through an online LMS to have to separately submit it to their ePortfolio. Finally, since research is the only way we will be able to better understand the methods and effects of ePortfolios.
in education, there needs to be an interface available for research projects to safely interact with the system.

SPARC ePortfolios

The SPARC ePortfolios system, built over the past 10 months, is a custom ePortfolio system intended to meet the requirements of the various stakeholder user groups. It has been built as a generic portfolio creation tool, attempting to require the least possible upfront computing knowledge from its users, and avoiding constraining them to any particular portfolio organization or content structure.

SPARC implements most of the previously mentioned ideas that the user groups have focused on. One of the areas where it could be improved is in the use of students as mentors; while feedback and interactions can occur between peers as opposed to solely between students and teachers, there is currently no provision for students to be able to create cohorts or announcements to those cohorts.

SPARC is built using the PHP Hypertext Preprocessor, a scripting language that can be used in conjunction with either the Apache HTTP Server on Microsoft Windows, Apple's Macintosh OSX, or any UNIX-flavoured operating system; or Microsoft's Internet Information Services server in Windows, and as such is operating system independent. It can use a variety of backend databases, and to date has been fully tested with PostgreSQL and Oracle 10g, and partially tested with Oracle 9i and IBM's DB2. It has been integrated with SFU's centralized account management system, and as such uses the university-wide account given to each student, staff or faculty member. (SPARC ePortfolios 2004)

Future Work

Current future plans for the SPARC system include research in three different dimensions: educational, technical, and educational technology. Plans include experimentation with 440 TechOne students with regards to ePortfolios over the coming year, as well as developments to the SPARC system to improve security, user modeling, and assessments of the learning impacts of utilizing electronic portfolios.

SPARC will also be extended to more closely follow the model laid out above, as well as attempting integration of with the learning management system at SFU. This has so far been delayed as SFU is currently in the midst of re-determining its LMS strategy, and potentially switching platforms.

Acknowledgements

The authors wish to acknowledge the support of the Canadian National Science and Engineering Research Council, in the form of Discovery Grants and the Learning Object Repository Network multi-year grant. As well, they wish to acknowledge support from Simon Fraser University in the form of Internal Research Grants.

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Towards an Upper-Level Ontology for Information Exchange in ePortfolios

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Abstract: Portfolios are lifelong projects which help people in their learning and job seeking. Unfortunately ePortfolio systems are neither universal nor eternal and eventually users must switch or use multiple systems. Information exchange allows users to change easily between systems without losing their data. Ontologies enable information exchange by formalizing and standardizing vocabulary and relationships. In this paper we discuss our approach to creating an upper-level ontology for the ePortfolio domain to facilitate information exchange between ePortfolio systems in the context of the SPARC ePortfolio system (SPARC 2004).

Keywords: Ontology, Interoperability

Introduction

Portfolios are inherently lifelong projects which are continually repurposed for educational assessment, job applications, reflection and learning. In contrast, particular tools tend to focus on a single use and are unable to share content that a user has entered, sometimes forcing the user to completely recreate their portfolio for each purpose.

ePortfolios cover such a wide area there are no widely adopted standards for their creation and use. There are specific technological approaches such as IMS LIP and IEEE PAPI Learner both currently under consideration as ISO standards. Unfortunately no one standard met the needs of SPARC’s diverse clientele.

Inspired by the progress of the Semantic Web movement with formal vocabularies (ontologies) the SPARC team decided to create an ePortfolio ontology for the SPARC project that could be used to adapt the project to multiple clientele. The team created a formal ontology for one application only to discover that their ontology was extremely specific to government guidelines and limited the possible uses. The team created multiple ontologies based on specific tools and needs and an upper level ontology abstracted from these specific ontologies to be used in information exchange between different tools.

Herein we give a brief introduction to SPARC ePortfolios, ontologies, and information exchange. We then discuss our process in creating the ontologies. Finally we go through our upper level ePortfolio ontology and discuss future work to be done.

SPARC ePortfolios

The SPARC ePortfolio project was first created to serve the specific needs of British Columbia high school students and teachers as they implemented an ambitious program to have all high school students graduate with a portfolio. The BC Ministry of Education created specialized requirements for topic coverage, assessment, and teaching of portfolios which the SPARC team adapted to create the software. As interest in the project grew the team was asked to create a version for use by first year students in the cohort based TechOne program at Simon Fraser University Surrey and to be used on a ongoing basis by those students after their first year, but no longer in a formal setting. Finally SPARC is attempting to make the system available to and usable by the general public, a domain in which needs vary widely and no specifications are present.

Need for information exchange

Information exchange is necessary between systems because a user will use many systems as they produce ePortfolios for different aspects of their life and at different times. Being able to transfer information between them is important for the user, so
they don’t have to re-enter the information, and for possible assessors, to evaluate the accuracy of statements in different portfolios.

Information exchange is also useful for transferring information to and from user models derived from the ePortfolio and other interested systems. The authors are developing user models which represent the user based on their ePortfolios. These user models allow us to do automated reasoning and inference on the data gathered and to incorporate other information that wouldn’t be in an ePortfolio such as specific habits, marks, and learning styles.

**Ontologies**

In computer science ontology has many definitions loosely derived from the original philosophical definition. Ontology is commonly defined as a formalization of a specification. (Sowa 2000) defines ontology as “a catalog of the types of things that are assumed to exist in a domain of interest D from the perspective of a person who uses a language L for the purpose of talking about D.” To paraphrase, an ontology combines a vocabulary, the relationships between terms in the vocabulary, and axioms over the vocabulary all from a specific perspective. Some researchers also include a means of performing inference such as first order logic in their definition.

Creating a single ontology for all things has been tried but found to be extremely difficult (Lenat 1995). The opposite approach, creating many very specific ontologies for particular tasks and domains, makes it challenging to exchange information because the ontologies must be manually translated, a time consuming and error prone process. Upper ontologies form the most abstract level of either approach, providing the basic vocabulary and relationships on which the rest of the ontology is based.

There are different levels of abstraction even in upper level ontologies. The highest level deals with general concepts such as objects, space, and time common to all applications (Sowa 2000). Upper-level ontologies can also define the general concepts used in a domain (i.e. education, physics, music, portfolios) and allow more specific ontologies to be built from there (Niles 2000). We follow the latter approach.

**Knowledge Engineering**

Initially we created a very specific ontology reflecting the software as implemented to the government guidelines (BC 2004). It was so specific as to be useless outside of the SPARC project. We set out to create a more general upper level ontology which could be extended to the various targets SPARC serves and also for other ePortfolio projects.

**Creating an Initial Ontology**

To create out initial ontology we followed the process described in (Noy 2001) step by step. This process is similar to object oriented analysis, picking out the relevant terms and then creating their relationships and properties. As shown in Figure 1 it was complicated and overly specific to the BC Ministry of Education requirements, even though the SPARC software was more flexible.
Figure 1: Specialized SPARC Secondary School Ontology

**Generalization**

Recognizing the need to generalize our ontology we developed a more general ontology by gathering information on what terms were commonly used and how in a variety of ePortfolio projects. After reviewing the terminology of a variety of projects, we investigated the OSPI project repeating the process to create a specific ontology. Necessarily our attempts were somewhat more general as we did not have direct access to experts involved in the creation of OSPI.

The authors also analyzed the requirements of the TechOne program to derive a second ontology which was not dependent on the ministry guidelines. This gave us three ontologies with many similar terms and some identical ones. We then took all of the ontologies and extracted the common elements to form the core of an upper level ontology. For the similar terms we added the most general ones to the ontology as synonyms of or specializations of other terms. Having defined the relationships between the terms we were left with the upper level ontology described in the next section.
Figure 2: Upper-level Ontology

Figure 2 shows the upper ontology we created. Only the classes and their relationships are represented in the figure. Slots (also known as fields or parameters) are omitted for clarity. The Portfolio class and its slots are displayed in Figure 3. For the complete ontology please visit our website. Clearly the upper level ontology uses more general concepts than the original ontology. This simplicity is partly due to the reduced number of concepts present in the ontology; lower level material such as grading is not present because it is not general to ePortfolios.

In order to be useful an upper level ontology must support extensions for particular purposes. The upper level ontology offers starting points for all of the lower level concepts. Assessment and grading have a specialization relationship with Feedback. Different organization schemes can be built off the portfolio and categories. The authors evaluated the success of the upper-level ontology (ULO) by extending it for each of the domains from which we generated it. We were successful in building back from the ULO to each of the specific domains, though it requires more effort for those using unusual terminology such as the BC Ministry guidelines.
Discussion and Future Work

The process of creating the ontology has been useful in understanding the limitations of our existing system. Comparing our SPARC ontology to ontologies based on other ePortfolio systems allowed us to approach standards in our own work. Current versions of SPARC are much simpler internally reflecting the coherence of the new ontology.

The authors are continuing to evaluate and improve the upper level ontology by evaluating more ePortfolio systems and standards for compatibility with the ontology. The authors are currently evaluating the utility of the created upper level ontology in information exchange. They are also creating several user models to support users and working on translating information between those models, and between models and ePortfolios.

No ontology is ever a finished product, especially in dynamic environments such as the web (Klein 2002), and developing domains such as ePortfolios. The upper level ontology must be tested with more ePortfolio systems, a task our group is currently undertaking. It must also be used to create knowledge bases and transfer information among them before we can rely upon it.

Acknowledgements

The authors would like to thank LORNet Theme 1 and NSERC for their financial support of this research.

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PS2
ePortfolio in schools
The e-portfolio in the STI – an interactive e-learning system

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Key words: Evaluation, Primary school, E-learning environment, Guidance, Self-evaluation

The design

The project for the creation of our primary school e-learning platform (called STI) started in 2003. It was based on the need to construct collaborative and cooperative learning situations for the pupils of an primary school district in Carnia, a mountain isolated territory located near Austrian border in the Italian province of Udine: a geographical situation with progressive depopulation, for which various economic support initiatives have been launched by local institutions. The problems raised by both teachers and school administrators were centered on the small number of students per classroom in the various schools, which reduced the opportunity for cultural and character growth due to the limited exchange of information and new learning environments. The Friuli Innovation Consortium (Consorzio Friuli Innovazione), the GSTI company and the Province of Udine created a project with the collaboration of the School of Educational Sciences and Information Systems of the University of Udine. This project aimed to create an online learning environment which would satisfy the need to create virtual classrooms (more numerous and more stimulating than the actual classrooms), and guide pupils in a computer-supported model of school work. The project team composed of various professionals created an e-learning environment which was tested together with the classroom teachers for one full year. Many aspects of the project were modified to facilitate simple and intuitive use by the student, and easy didactic module construction for the teacher.

The design was defined by two elements: the choice of a relative theoretical approach to the teaching and learning processes, and the wish to build a powerful but very simple graphic user interface under Microsoft® Windows® developing the system under the RAID Borland® C++ Builder®.

Various problems arose to the project group. First, it was necessary to create an environment not only allowing different educational situations to be linked to child's background, but also allowing teachers to create teaching modules. Teacher could build didactic modules through base structures (like sample modules) and use them in different times and different ways in common with other teachers too.

The second problem concerned the central role of the pupil in the learning process. How to make the student the protagonist in the construction of his own self-awareness, and as a collaborator with others? Three solutions were adopted:

1. The project group is co-ordinated by Prof. Pier Giuseppe Rossi, professor of general education at the School of Education Sciences, Ing. Matteo Macoratti, ITS technological planning, and Dott.ssa Maurizia Blam and Dott.ssa Patrizia Magnoler, the trainers who follow the ITS project, the didactic activity planning and the teacher training for the project.
to provide flexibility in the construction and reconstruction of the modules by teachers according to educational needs expressed by the students;

to introduce moments and space for self-reflection, self-evaluation and co-evaluation with the teacher throughout the program and in all the materials.

The third problem was about the function of the teacher who must reconcile various commonly attributed aspects of the professional tutor. The teacher must be an expert of content and therefore of the chosen medium, be able to plan and create didactic activities according to personal methodology and evaluate the student's work.

The tutor is more involved in helping student to learn, is a facilitator of social relations and maintains a continuous monitoring of the student's work and ideas.

In design process, we thought each tool following all this correlation and interaction aspects.

The e-portfolio: premise

The STI e-portfolio is the representation of multiple actions made at different times. It satisfies two objectives: evaluation and guidance. Evaluation means assigning a complete judgement based upon many factors. Guidance means the progressive discovery on the part of the student by means of his own learning style, and the consequent design of the student's possible self.

During the creation of the e-portfolio certain criteria were ever-present:

to continuously show the student's progressive skill acquisition, even over long periods of time;

to favor personalized learning by mirroring the student's learning style and forming a personalized learning plan;

to maintain past memory by facilitating the information recovery processes;

to collect materials developed both individually and by groups, to determine specific times and spaces within the module to favor the transition from teacher managed analysis and evaluation to more self-directed, student-managed activity.

The e-portfolio is a component of a more complex environment composed of internal didactic modules in which students can carry out various activities. The environment, the tool-created examination paper and the online classroom register (present in every module) constitute a dossier from which the student and the teacher can draw materials to construct the e-portfolio.

But before presenting the e-portfolio we give a rapid overview of STI environment and its tools.

The learning environment online

Module structure

The module is the minimum element upon which the single areas are based: it covers a period of classroom work which lasts from one to ten hours and may be spaced out over several days. It can be freely planned by the teacher inserting the activity tools as if they were building blocks. The module structure contains:

- an initial, problematic situation;
- a list of activities designed by the teacher; the teacher choses for each activity a tool and decides which group of students will work with it;
- a page for remarks;
- the materials available (video, images, texts and audio) which the teacher draws from the library and inserts in the module.

Before describing the e-portfolio it is necessary to describe the tools, and to understand how them support evaluations, guidelines and the e-portfolio.
**Forum**

There are two types of forum within the environment: indented and unindented. While using the web forum the teacher can intervene to develop a discussion, reinforce some interesting but overlooked ideas expressed by the students and also mirror to encourage a better clarification of ideas (Lumbelli 1987). Oral and written communication are mixed together: the real-time immediacy of messages allows an evolution of the discussion and at the same time the written format allows re-reading, reflection and remarks. Both synchronic and asynchronic activity are realized within a short time frame. Messages are short texts which are arranged in order according to “who answered whom”, permitting an analysis about how a single subject was developed. It is possible for the teacher to follow how different students build knowledge based on the expressed content, the type of message (summarizing, development, confirmation, question, opposition, reasoning) and the ability to reach either an individual or group synthesis.

**Individual text**

This tool allows the student to create a personal text. While the student is writing the teacher can see the situation in progress: the teacher can interrupt the writing to send a message of reinforcement, to focus on specific subjects and to bring attention to spelling, syntax and/or content. It is easy to imagine what type of information can be gathered by this kind of interaction: the teacher can understand the student's style of work, how the student begins a text, how many versions the student prepares before completing the task, how many corrections were made. The system saves each text versions and this allows the elaboration process to be reconstructed, as well as the final version of the work.

**Maps**

The map tool has two different applications: it can be used by an individual student or by different students on the same map. An individual map represents the mailstones of a subject and shows the ability to identify key concepts and connections, to hierarchize those concepts and to construct an effective and comprehensible graphic communication. If it is used as an instrument to reorganize information it demonstrates the ability of the student to understand categorization, to use it in an effective way and to create a visualization of the status of a particular research.

The collective map highlights three other aspects of student work: (1) how to read the contents and the proposals of others, (2) how to respond in relation to these (complete them by adding other key ideas, repeat the same content with a different approach, build or modify relations among key ideas), (3) how to identify problems and determine what kind of help is needed. The same interactive aspects of social construction are visible on the shared blackboard and in the construction of the collective text.

**Diary**

The student page contains a diary which the student can access at any moment and in which he/she can insert remarks, personal observations and record information which is considered significant.

**Evaluation**

From the above description you can deduce:

- every build material is memorized and saved;
- many tools allow to record the “frames” of the work, freezing its state in a certain moment like a photo, by which it is possible to reconstruct the learning path;
- the teacher can evaluate every examination paper and add a concise assessment, a comment visible to the student and an assessment visible only to the teacher.
Every examination paper is connected to the concise assessment with a numerical or graduated scale which refers to an index, the teacher’s comment and the student’s remarks. This “record” contains quantitative and qualitative data which can be compared with the remarks and comments.

The teacher has a specific tool for evaluations: the class register. A table lists the names of the students in a column on the left-hand side of the page, while various activities are listed in other columns. The teacher inserts a new column for every new activity. The class register looks like a classic table. By clicking on the intersecting space specific work can be visualized, complete with notes which explain the reason for the particular evaluation. The “register” tool is visible only to the teacher and allows a complete view of the assessments given to students for various tasks completed both online and in classroom.

The environment provides the teacher with a multitude of data that regards the learning process that occurs during a student’s work.

**Guidance**

In STI the module structure and the presence of tools allows the student to better understand herself/himself by returning to and reviewing a completed task or experience in different ways. Here there are some examples of this:

- the ongoing comparison with the teacher during the activity, whether in classroom or online;
- the mirroring and tutoring by the teacher;
- the post-work narrative as a means to recall the sense of the work, and to attribute new importance to the work chosen and how it is connected;
- the possibility to spontaneously note one’s own doubts and difficulties in the “diary” without concern for how these will be inserted in the portfolio.

**The e-portfolio**

The e-portfolio collects work chosen by the student and/or the teacher. The portfolio tool is organized in this way:

- the initial page contains a presentation of the student;
- the showcase organizes three types of documents:
  - the general list of skills to monitor;
  - a list of chosen materials for every skill, with every item of the list is linked to the work chart; the list is organized as a table and each record contains document title, categories, date and who chose it;
  - the chart of each individual task is organized as a link to the work itself, a text field in which the student explains why he’s inserted that material, and a text field in which the teacher explains how that task constitutes a significant passage in the contruction of a particular skill.

The main element of the e-portfolio is the showcase created for the task construction, in reference to the modelization proposed by H. Barrett (2002) and by Danielson and Abrutyn (1997).

The construction phases of the e-portfolio is given substance in the link between anchors and materials. The artefacts are positioned in a single database but the links to these can be multiple and positioned in different sections of the environment.

Once completed, every module is memorized in the Library which is accessible to all and can be visited and re-visited at different moments and for different reasons. The student can examine how he (or she) was and how he has become in relation to a particular ability and skill, comparing himself with the teacher or with other classmates. By reading his (or her) own notes he can begin to identify work by which he has discovered new strategies or tested himself against new problems. The library therefore represents a collection or a dossier.

**Collection** passes to **selection** of significant material which constructs a “brief story” told in essential installments entered in the pages dedicated to remarks, which are
realized in the showcase construction. After this passage it is easier to reflect to
determine how to do better, and to identify precise goals (projection) with which to
calculate one’s self in the near future.

The portfolio and publication

In the modules, the rapid recovery time of materials and learning paths allows
comparisons to be made among various participants. The first publication is among
students, when they view the construction of their own portfolios with their
classmates. They tell which strategies they’ve adopted, the obstacles they’ve
encountered and the solutions they’ve found. It is a very important moment which
involves everyone in the study of how he/she can become an expert in his own
learning. Another goal is his/her ability to listen to the more or less expert advice
given by the others, and making tangible to the student his own personal way within
a community, without level-based evaluation.

The second activity relates to the publication of the students’ e-portfolio during
planning/training among teachers. The initial comparison arises within the
pedagogical team which works directly with the same classroom of students, but a
wider debate and deeper examination can come about when teachers belong to
other classrooms (of other schools) and meet them to review how the portfolio
produces learning improvement among students. This is how the community of
experts (Wenger, 1998) enriches itself from the contribution of all: the diversity of the
work and of the processes taken into view become material for reflection and for
reconsideration for entire schools or schools online.

The third type of publication regards the family. A direct examination of a child’s
portfolio, and a discussion with the child’s teachers guides the parent in a common
study of the student’s potential and difficulties. Working with visible items rather than
opinions and undocumented evaluations helps to build a collaborative relationship in
dealing with specific problems.

A further step can be taken to make evident the quality of an individual school’s
action. With due protection for privacy, some portfolios can be published on the web-
site of the school or shown to other classrooms or schools or other institutions.

Our e-portfolio underlines shared philosophy about education among
teachers and the differences among various didactic methodologies: many
experiences have shown how personal and collective examination of declared
individual convictions changes (Goodyear and Allchin, 1998) moving effective
scholastic evaluation axis from the systemic-organizational view to an
increased improvement of human resources. It favors the development of
innovation, the diffusion of positive experiences and the strengthening of community
interaction among the participants.

CONCLUSION

The first STI experimentation year has met some objectives about usability and
didactical design. This year helped us too to understand and define better
effectiveness about STI way to work characterized by blended activity and e-portfolio
construction.

We can now focus on changes involved through technologies in didactic planning (by
teachers). Teachers must review subjects in didactical modules about different areas
and manage knowledge through a criss-cross landscape.

Another objective regards the good level of STI usability and accessability. This was
achieved by continuous testing with the teachers and the students. As for learning
efficiency and the portfolio, we design a plan for the gathering of information in the
initial stages, making possible comparisons during the entire period of research. In
particular, data will be collected on the criteria most frequently used by teachers and
by students to evaluate a task:

- teachers and students criteria to evaluate students works;
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- teachers and students criteria to compare learning strategies;
- students observations about their way to deal with school work;
- teachers observations about possible teachers already realized personalized processes;
- indicators about skills evaluation.

We hope, for the end of the next school year, to get data about understanding how an e-learning environment can influence learning and how e-portfolio permits effective co-evaluation and self-evaluation processes.

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The role of ePortfolios in enhancing meaningful and reflective learning

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Abstract: The use of modern multimedia technologies provides learners with alternative pathways for constructing knowledge and generating understanding. This paper investigates the connection between meaningful action-reflection learning and ePortfolios based on a six year study of over 200 student ePortfolios using a multidimensional “evaluation of reflection” rubric. The analysis demonstrates that students can be challenged by more complex and open-ended tasks while the ePortfolio constructed by the students is often more creative, relevant, sophisticated and meaningful.

Introduction

Action-Reflection Learning

The importance of action-reflection learning in constructivist based pedagogy has been well documented from the early seminal work by Donald Schön (Schön 1987) through various researchers (e.g. de Jong, 1996) to more recent contributions as this quote from the Southwest Educational Development Laboratory – Technology Assistance Program (2000) illustrates.

“Learning is both an active and reflective process. Though we learn by doing, constructing, building, talking, and writing, we also learn by thinking about events, activities and experiences. This confluence of experiences (action) and thought (reflection) combines to create new knowledge. Both action and reflection are essential ingredients in the construction of knowledge. Indeed it is difficult to extricate one from the other since we are often ‘parallel processing’—reflecting upon activities even as we are in the midst of doing or experiencing them. Because learning is so often subconscious, we don’t realize we’ve actually gained new knowledge or understanding until we stop to contemplate a particular activity. Reflection then is the vehicle for critical analysis, problem-solving, synthesis of opposing ideas, evaluation, identifying patterns and creating meaning—in short, many of the higher order thinking skills that we strive to foster in our students.”


It is argued that the action-reflection cycle is a very important way in which learners can develop effective ways of creating knowledge, generating understanding and acquiring wisdom as well as fostering independent learning. Figure 1 shows one schematic of the action-reflection cycle.

Figure 1 - Action-Reflection Cycle

Alternative Pathways

The model of alternative pathways for constructing knowledge and generating understanding has strong theoretical support and is based on notions of learners having different personality types and different intelligence styles.

For example, it is often useful for learners to be able to understand and reflect on the concept of different personality types, what their own personality type is, and the
specific personality types of their friends and fellow learners. One instrument that can be effectively used for this is the Meyer-Briggs Personality Type Indicator (MBTI®).

In a similar manner it is extremely valuable to have learners understanding and reflecting on different intelligence styles. A great deal of interesting work has been going on in applying Gardner's multiple intelligences to primary and secondary school learning experiences (Figure 2 – DiNapoli 1999).

Figure 2 – Gardner's Multiple Intelligences

The need for this is crucial. As Armstrong (2002) notes:

"Dr. Gardner says that our schools and culture focus most of their attention on linguistic and logical-mathematical intelligence. We esteem the highly articulate or logical people of our culture. However, Dr. Gardner says that we should also place equal attention on individuals who show gifts in the other intelligences: the artists, architects, musicians, naturalists, designers, dancers, therapists, entrepreneurs, and others who enrich the world in which we live. Unfortunately, many children who have these gifts don't receive much reinforcement for them in school."

Other educators and researchers have successfully used the classification scheme inherent in the Hermann-Brain dominance model (Figure 3 – HBDI 2004) to get their students to understand and reflect on different intelligence styles. According to the Hermann-Brain dominance model learners will normally be dominant in one quadrant:

A - Theorists  B - Organizers  C - Humanitarians  D - Innovators
Studies have shown that when an activity matches a learner’s preference, there is an increased probability that learning will occur. These are some of the learning preferences for learners whose strength lies in a certain quadrant.

- Precise definitions (theorist)
- To-the-point, factual learning (theorist)
- Step-by-step instructions (organizer)
- History, timelines (organizer)
- Brainstorming or free association activities (innovator)
- Visual or graphic mind-maps (innovator)
- Use of personal impact stories (humanist)
- Collaborative activities (humanist)

Contrarily frustration will be experienced by learners if the learning environment has the following characteristics:

- Vague, ambiguous instructions (theorist)
- Inefficient use of time (theorist)
- Too slow a pace (innovator)
- Lack of overview/conceptual framework (innovator)
- Disorganization, poor sequencing, hopping around (organizer)
- Lack of practice time (organizer)
- Impersonal approach or examples (humanist)
- No sensory input; sterile learning climate (humanist)

Power, Kummerow and Lundsten (1999) showed that there was some correlation between MBTI® and HBDI (namely in the Introverted Thinking and Theorists, and Extraverted iNtuition and Innovators). However I would argue that there is still a substantial benefit in using both techniques for meaningful reflection on personality types, intelligence styles and learning attributes by learners.
For the purposes of this paper we use the definition of ICT (Information and Communications Technology) provided by the Westminster Institute of Education (WEI 2000):

“ICT includes computers of all the kinds currently used in schools, e.g. laptops, calculators, with all their in-built facilities, e.g. the information available via the Internet; all related software, e.g. programs, CD-ROMs; all available and/or related ICT hardware, e.g. headphones, tape recorders, TV, radio, video recorders; and all potentially useful communications technology, e.g. the communications possible via the Internet, video and computer conferencing, intercom systems, etc.”

The importance of ICT in education, according the Westminster Institute of Education (WEI 2000), is that it creates reflective learners whose thinking and learning is more explicit.

It is not a case of whether or not we are to use ICT in education but just a matter of facing the inevitable.

Spender (2002) notes that:

“We don’t have any choice about embracing e-learning. Just as those of us who are adults had no choice about books and print as the organising principle in our own education. But we do have choices as to how we will implement this new learning. We can shape the environment to foster new, and appropriate individual and social values for the 21st century. With a little help we can provide an innovative, exciting and quality education system which learners will willingly engage with.”

Information and Communication Technologies provide educators and learners with unprecedented opportunities and challenges to promote meaningful understanding of concepts through different learning modalities.

**ePortfolios**

“An educational portfolio documents the development of human capital or intellectual assets.”

(Barret 2003)

The idea of portfolios is not new. Before electronic portfolios came along we had portfolios and before that collections of educational experiences. As Barret (2003) suggests:
“Those of us who grew up in the 1950s or earlier recognize portfolios as reincarnations of the large memory boxes or drawers where our parents collected starred spelling tests, lacy valentines, science fair posters, early attempts at poetry, and (of course) the obligatory set of plaster hands. Each item was selected by our parents because it represented our acquisition of a new skill or our feelings of accomplishment. Perhaps an entry was accompanied by a special notation of praise from a teacher or maybe it was placed in the box just because we did it.”

Like all forms of portfolios electronic portfolios provide a useful way of collecting a learner’s intellectual capital. It also provides us with opportunities to facilitate, enhance and assess the development of student learning over time. Worthwhile electronic portfolios demonstrate the learner’s reflective thinking and illustrate their acquired understanding as well as their practical skills in effectively using appropriate learning technologies.

It is critical that the ePortfolio forces learners into a Planning-Action-Reflection-Learning cycle because this helps learners develop independent learning, and creates an environment involving logical planning, deliberate and directed information gathering, processing and evaluation of information, reflection on the process, problem-solving and the generation of knowledge and understanding.

Brown (2002) in a portfolio development study concluded learning portfolios
- increased students’ understanding of what, why and how they learned
- enhanced the communication and organisational skills
- reinforced the importance of reflection in learning.

Barret (2003) suggests that an electronic portfolio without reflection is just as
- Digital scrapbook
- Fancy electronic resume
- Multimedia Presentation
- Personal web site

Tosh (2004) suggests that: "(o)ne main strength of the ePortfolio is the ability to alter the dynamics of learning pedagogy, students are actively engaging in their learning not just the recipients of information. Reflecting on what they are learning may help map out future direction."

Therefore the use of electronic portfolios in learning has to incorporate the critical aspect of reflection in a strictly metacognitive sense. De Jong (2004) has demonstrated that of all the positive features associated with electronic portfolios it is the action-reflection cycle that presents the most powerful attribute the effective and meaningful learning.

**Context**

**Background**

The students involved in this study are students at an all boys secondary college (Years 7-12: students aged 12-18), Whitefriars College, run by the Carmelites in Donvale, Victoria, Australia. There are approximately 1120 students on a single 40 hectare campus with almost 100 EFT teachers and 25 support staff including 8 EFT computer assistance staff. All staff are given a notebook as part of their working conditions at the College and all staff have them 24/7 access to the College intranet and to the outside world via the internet/email. Each student has their own notebook computer which also gives them 24/7 access to the College intranet and to the outside world via the internet/email. The notebook program is compulsory. The students use their notebooks in all areas of the academic curriculum. The notebook program has been running now for a period of seven years. All staff are involved in intensive professional development.
Learning environment

The learning environment at Whitefriars College is unique in many ways. We are one of only a few middle range fee structure Colleges in Australia that has implemented a full notebook computer program, and we are considered by our peers to be one of the leaders of using such technology. For the students the use of notebooks for their learning is no different to that of other students using pencil and paper. That is, notebooks are just a powerful tool (as Papert (2004) noted: “a powerful mindtool”) that are used almost transparently in their day to day learning. The learning environment throughout Years 7-12 has been significantly altered since the notebook program began and involves considerable more student directed learning tasks centred on real life problems, issues and events. Teachers act as facilitators and guides rather than as the supreme fount of knowledge (“the sage on the stage”). Learning is more collaborative with teachers, fellow students in the classes (and across class and year levels), external learners, interested parties and experts from cyberspace all contributing to generating an understanding of what are often very complex problems, issues and events. Learning is based on multiple intelligences, constructivism, metacognition and reflection. The notebooks provide excellent mindtools for the students to explore ideas and generate knowledge and understanding.

The major difficulty that is experienced in this type of learning environment is that at the senior level (Years 11-12) the students need to be “dumbed down” for external testing regimes that take place during Year 12 and become critical for entrance to university. In most subjects there is virtually no recognition that students live in an ICT era and that they are savvy users of multimedia, intranets, internet and rich and complex information sources and are capable of meaningful learning through multiple learning modalities. Instead students are required to sit strictly time controlled pencil and paper tests that focus only on linguistic and logical-mathematical skills. This in turn creates a dilemma for their teachers. Should we sacrifice meaningful learning using ICT and concentrate more on traditional teaching so that students will be better placed to succeed at the final exams that will determine their entry into selective university courses? Or can we improve student understanding to such a degree using ICT that they are at least as capable if not more so than traditionally taught students? Therein lies the challenge.

In my role as a curriculum writer for the VCE (Victorian Certificate of Education) Physics Study Design (de Jong 1996) it was possible to convince the Victorian Board of Studies (VBOS) that an internal component of assessment at the senior secondary level (worth 34% of the students total marks to be used for university selection) could be based on ICT work undertaken at the school. Although it could not be made compulsory (not all schools have access to ICT) it was stipulated as an option and schools were encouraged to incorporate it into their program.

Specific task

Senior secondary physics students in one of their units have to undertake a core study of Light and Radioactivity and detailed studies in one of the following areas: Astronomy, Medical Physics and Nuclear Energy. As part of an earlier study into metacognition and reflection in physics learning (de Jong 1996) and with my increasing understanding of the significant role that ICT would play in learning it was decided to test what role ePortfolios could play in facilitating meaningful and reflective multi-modal learning.

The specific task then was for students to create an ePortfolio selected from one of the following areas of the standard senior physics curriculum: Radioactivity, Nuclear Physics, Astrophysics and Medical Physics. The underlying physics concepts are clearly identified although no templates are provided for the students. This allows students to use their own preferred style of portfolio construction which reflects their particular pattern of knowledge generation based on the theoretical constructs described in Section 1 of this paper. To ensure that the students obtain a breadth in their ePortfolio students are further encouraged to research the societal and technological implications of their specific topic. Such aspects must also be included in their final ePortfolio submission. Students design their own ePortfolio in this...
specific area over a period of eight weeks. It is during this phase that the Planning-Action-Reflection-Learning cycle is critical to the construction of the ePortfolio. Students are then required to submit their ePortfolio for multiple assessments involving peer assessment, teacher/external assessment and self-assessment. An integral component of the assessment requires students to present their ePortfolio to their peers as a specific lesson and the presenters must also be able to answer any pertinent questions asked by their teachers, external assessors and their peers. In this structure critical student self-reflection becomes an integral part of the portfolio development for both learning and evaluation purposes.

Methodology

Over a period of six years 218 different student ePortfolios were constructed by the students and analyzed by the researcher. The analysis of the learning was to be undertaken by using an evaluation based on one described by Bhattacharyya (2001). This evaluation of reflection is constructed on the degrees of Conceptualization and Implementation, Cooperation and Collaboration, Critical Thinking and Decision Making, Evaluation and Modification, Creativity and Innovation, Metacognition and Progression apparent in the ePortfolios created by the students. The theoretical framework for this form of analysis is further elaborated on in the analysis section (Section 3 below). Each student was then classified via this method and some typical types of results are presented in Section 3.

3. Analysis

3.1 Theoretical framework

The interpretation of results from this type of investigation either involves the creation of a completely new analysis methodology or preferably the adoption of an existing methodology from the relevant literature. One of the studies of interest in the use of a rubric for evaluating the reflection components of ePortfolios had been presented by Bhattacharyya (2001) and this became the basis of the theoretical framework for the analysis of the present study.

Bhattacharyya (2001) in presenting her design for an evaluation rubric presents an overview of an evaluation rubric used by Jonassen.

“The rubric has been design based on the attributes of meaningful learning (Fig.(5)) or characteristics of meaningful learning (Fig.(6)).

![Figure (5)](image-url)
Bhattacharya (2001) continues:

“Our rubric for ‘evaluation of reflection’ consists of six categories such as: Collaboration and Cooperation; Metacognition and Progression; Critical Thinking and Decision Making; Conceptualization and Implementation; Creativity and Innovation; and Evaluation and Improvement. All these categories are very much interconnected. Among each pair of words one word complements the other. Such as Progression is the manifestation of Metacognition, Critical Thinking is a characteristic of a good decision maker, and so on. The rubric is presented as a hexagonal cobweb structure where each of the vertices refers to one of the criteria of evaluation and each criteria is rated on a five point scale where the vertices of the innermost hexagon represents lowest ratings and the outermost hexagon represents the highest ratings. Detail description of ground-rules for the ratings was also developed in order to standardize the ratings. The diagram in figure (6) shows the typical pattern of assessment results of a student’s reflection.

This method was adapted for the current study and a similar template was generated that is shown in Figure 7 below.
Figure 7
Illustrative project

The atomic bomb named "Little Boy" was dropped on Hiroshima by the Enola Gay, a Boeing B-29 bomber, at 8:15 in the morning of August 6, 1945.
3.3 Results

Figure 8 shows a hypothetical student who demonstrates high in each of the six areas on a five point scale from the inner hexagon to the outer hexagon (see legend below).

Legend
- Inner hexagon: 1 - very low
- Second hexagon: 2 – low
- Middle hexagon: 3 – medium
- Fourth hexagon: 4 – high
- Outer hexagon: 5 – very high

Naturally data from real students is more varied. The results for 2 different students are illustrated below in Figures 9 and 10. These are presented to demonstrate the powerful visual approach of this particular methodology. The rubric is not only easy to understand in this format for research purposes but also provides, with detailed explanation, valuable feedback to the students for the next ePortfolio tasks.

Figure 9 shows the results for student AH -34.

Figure 9

Figure 10 shows the results for student BR -187.
4. Conclusion

The challenge faced by the students is to maintain the reflective practice and unswerving commitment they discovered in creating their ePortfolios into their mainstream learning – particularly as it mutates as they progress through their formal secondary education into a greater number of pencil and paper tasks in preparation for their examinations as required for university selection.

Using information and communication technologies to construct ePortfolios opens up new dimensions for both teachers and learners. The tasks given to students are capable of being both more complex and open-ended while the construction of the ePortfolio by the student is far more creative and sophisticated. The use of ePortfolios enables a variety of assessment strategies to be used that not only capture the quality of a student's work but also reflects the actual learning process and is thus much more meaningful than traditional assessment. This approach allows not only the final product to be assessed but also the actual process of learning, the construction of knowledge from the information discovered, the development of conceptual understanding generated, the richness of the ideas created and woven together and the learners ability to both grasp the concepts and to explain these concepts to others.

The future plan is to implement this modified instrument across the curriculum Years 7-12 at the College and then to see if it will become part of the external assessment system in the educational system. To date all the data was analysed using exhaustive one on one analysis techniques. It is hoped that a computer-generated rubric might be able to be developed to assist in the processing of data. Future research needs to address whether reflective learners at least equal to or are more effective in pencil and paper tests than those taught using traditional methods.

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E-Portfolios in Quebec Schools

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Abstract The Centre for the Study of Learning and Performance (CSLP) at Concordia University is a research-centre of excellence dedicated to actively collaborating with educational policy-makers and practitioners to develop and to disseminate evidence-based tools and techniques. In this paper, we describe: why we are eager to develop tools and techniques to improve education: what we have gleaned from the literature on electronic portfolios as one such tool; the process and showcase tool we have developed; and our plans for research and further development.

Keywords: electronic portfolios, digital portfolios, authentic assessment, primary and secondary education.

The State of Education in Quebec and Canada

The OECD Program for International Student Assessment (PISA) 2000 measured how well young adults around the world are prepared to meet the challenges of today's knowledge societies. To do so, PISA 2000 surveyed reading literacy, mathematical literacy, and scientific literacy among fifteen-year-old students in 32 countries worldwide. Reading literacy is defined as the ability to understand, use and reflect on written texts in order to achieve one's goals, to develop one's knowledge and potential, and to participate effectively in society. Mathematical literacy is defined as the capacity to identify, understand and engage in mathematics, and to make well-founded judgments about the role that mathematics plays in an individual's current and future private life, occupational life, social life with peers and relatives, and life as a constructive, concerned, and reflective citizen. Finally, scientific literacy is the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes to it through human activity.

As a nation, the average performance of Canadian students was in the upper quartile on the PISA measures of reading, mathematical, and scientific literacies (OECD, 2000; Statistics Canada, 2002). Upon closer examination, however, there is substantial cause for concern. The range of Canadian scores was wide; fully twenty-five percent of Canadian students performed at low levels of proficiency in reading, mathematics, and/or science.

In reading literacy, 27.6% of Canada's youth performed at Proficiency level 2 or below. These students are not all capable of basic reading tasks. Some cannot locate straightforward information, make low-level inferences of various types, work out what a well-defined part of text means, or use outside knowledge to understand it. Furthermore, none of these students is proficient at reading tasks of even moderate difficulty, such as locating multiple pieces of information, making links between different parts of text, or relating newly acquired information to familiar everyday knowledge.

In mathematics literacy, less than half of Canada's youth were able to interpret, link and integrate different representations, use and manipulate a given model, and verify given propositions. As many as 5% struggled to manage a single mathematical processing step, consisting of reproducing basic mathematical facts or applying simple computational skills.

In science literacy, less than half of Canada's youth were able to use scientific concepts to make predictions or provide explanations; to recognize questions that can be answered by scientific investigation; or to select relevant information from competing data or chains of reasoning in drawing conclusions. More than 5% struggled to recall simple factual scientific knowledge and to use simple common scientific knowledge in drawing conclusions.
In computer literacy, technology is growing increasingly pervasive and ubiquitous as a powerful and flexible tool for home, business, and school. The effectiveness of technology education whereby schoolchildren develop essential skills is open to question. Ungerleider and Burns (2002), reviewing mostly Canadian research, found that computer technology was not being used optimally to promote achievement, motivation, and metacognitive learning, nor to enhance instruction in elementary and secondary school content areas. Progress in technology education and use is both necessary and overdue.

In short, despite scoring relatively well overall, there are a meaningful percentage of Canadian students who did poorly. When we turn our attention to other nations, a very few scored better than Canada overall, while most nations scored worse. But whether for the best nations or the worst, there are problems with student performance. Therefore, these results are a sobering reminder that there is an international problem with education and we must act to do a better job today for the world’s citizens of tomorrow.

The problems start early in school and are pervasive across key academic areas. One of the reasons is that schools too often disengage learners and fail to encourage honest self-assessment. In the school environment, learning and evaluation are not meaningful acts of improvement but detached and punitive symbols of failure. Grades become sources of self-identity rather than an evaluation tool that teachers use to help students address their areas of difficulty. So, in addition to dramatically improving their academic skills, at-risk learners must also improve their attitudes, motivation, and engagement.

The Consequences of Poor Literacy. Literacy skills are crucial for both the individual and for society. Literacy skills are linked to a person’s employment potential, desire to engage in lifelong learning, and self-esteem. A reduction in illiteracy results in higher levels of employment, greater earnings potential, and individuals who are more self-supporting, thus enabling individuals to participate more fully in our economy and in Canadian society (International Adult Literacy Survey, 2000).

The International Adult Literacy Survey (2000) reported that people with higher levels of reading literacy are more likely to be employed and to have higher average salaries than those with lower levels. For example, adults with low literacy scores and less than an upper secondary education have almost zero probability of skilled employment.

A recent study by Statistics Canada (Coulombe, Tremblay & Marchand, 2004) analysed literacy scores, human capital and growth across fourteen OECD countries. Among their conclusions: a one percent increase in the literacy rate of Canadians will drive a sustainable $18.4 billion growth in Gross Domestic Product (GDP) annually.

The National Research Council (1998) wrote: “Children who struggle in vain with reading in the first grade soon decide that they neither like nor want to read. Even if they do not fall into any of the recognized at-risk categories, these children soon are at risk of poor literacy outcomes.” (p. 172)

Human Resources Development Canada (1994) reported that 28% of children 0-11 years old (some 1.2 million Canadians) had at least one behavioral or learning problem. For these children, lack of learning readiness makes it more difficult to adjust to school, to succeed academically, and to be accepted by their peers.

According to a joint study of Human Resources Development Canada and Statistics Canada (Bowlby & McMullen, 2002), the average provincial high school dropout rate was 12%. The main reason given by students for dropping out of school is overwhelmingly school–related (41.7%); personal or family (16.9%), work-related (27.3%), and other reasons (14.1%) are much less often given as reasons. High school dropouts rate their academic skills poor or only fair as compared to graduates (G) in a wide range of areas.

Statistics Canada (1996) reported that 72 percent of adult welfare recipients have less than a high school education.
Statistics Canada (1999) reported that more than 20 percent of primary-school pupils have to repeat a grade before going on to secondary school and 70 percent of those pupils drop out of high school. Almost 20% of children 15 years old or younger (some 1.4 million households) live in a low-income household. These children show higher than average rates of behavioural and learning problems, lower readiness to learn upon school entry and higher dropout rates.

The Literacy Solution. Researchers, educators, and the business community have all commented recently on the future of education often focusing on student-centred learning (American Psychological Association (APA), 1997; Council of Ministers of Education, Canada, 2001; Corporate Council on Education, 2000, 2003; National Research Council (NRC), 2004; Quebec Education Program, 2000; Quebec Policy on Science and Innovation, 2001). These approaches share the view that learning and understanding are an active process during which learners question, manipulate, elaborate, organize, and monitor their progress so that learning makes sense to them. Learning is an active construction of meaning, influenced by myriad internal and external factors (e.g., prior knowledge, cognitive development, task demands, etc.). Furthermore, these approaches also take into account that complex cognitive activities are normally carried out in challenging environments, that is, context may have a significant bearing on skill mastery, execution, and transfer of knowledge as situated within the culture, setting, history, and environment— including social context— of the learner. Most of these groups propose the adoption of technology as a potential remedy for the challenges of student learning. For example, a recommendation given by the MRST (2000) in the Consultation Document for a Québec Scientific Policy is that we “speed up ICT integration into education in all subject areas and at all levels” (p.16). But as technology becomes more powerful, flexible, and ubiquitous, it behoves us to use it wisely for learning.

The Government of Canada recognized the Knowledge Performance Challenge in Achieving Excellence: Investing in People, Knowledge, and Opportunity (2002): “Our supply of highly qualified people is far from assured in the medium term. Canada will have great difficulty becoming more competitive without a greater number of highly qualified people to drive the innovation process and apply innovations, including new technologies” (p.19). These comments reflect the need for improvements to education in response to global competition, the demands of the knowledge-based economy, and the need for Canadians to possess the skills that are necessary for successful learning. Developed, complex skills are essential for success at colleges and universities, the final training ground of tomorrow’s highly qualified Canadians. But the building blocks of such skills are rooted earlier in each student’s education. Thus, it is crucial that all children learn basic reading and writing skills because of their central role in virtually all the activities that characterize contemporary society. In Knowledge Matters: Skills and Learning for Canadians, the Government of Canada (2002) proposed the following national goal: “To give our children and youth the best possible start in life.” Specific milestones toward this goal include the following:

“Canada becomes one of the top three countries in mathematics, science, and reading achievement;

All young Canadians are computer and Internet literate by grade school graduation; and

All students who graduate achieve a level of literacy sufficient to participate in the knowledge-based economy.” (p. 23).

Using Technology for Learning. Computer-based technologies are seen by advocates as powerful and flexible tools for learning (Bereiter, 2003; Harasim, Hiltz, Teles & Turoff, 1995; Scardamalia & Bereiter, 1996; Dede, 1996). There is so much optimism about the potential of technology to impact positively on learning that the Council of Ministers of Education, Canada (CMEC) reported: “As learning modes and needs change in response to the knowledge-based economy, education is also changing. OL learning is pedagogically increasingly important, and a subject of discussion within Individual provinces/territories, at the pan-Canadian (i.e., CMEC) level, and in the international arena. Provincial/territorial governments, postsecondary
institutions, the on-line learning community, and the Advisory Committee for On-line Learning have all noted that an increasingly global and technological society creates new and increased pressures for learning systems to be adaptable, accessible, and flexible. The enhanced accessibility, flexibility, and responsiveness made possible by on-line learning technology make it well-suited to support lifelong learning, whether used in conjunction with and as an enhancement to traditional models of education, or as a stand-alone option” (CMEC, July, 2001, p. 01).

Methodological challenges. To date, however, there is much promise but less substance, especially long-term evidence, regarding the effective uses of technology for learning. For example, a review of research on the effectiveness of learning in higher education (The Institute for Higher Education Policy, 1999) concluded “The most significant problem is that the overall quality of the original research is questionable and thereby renders many of the findings inconclusive.” (p. 3). Similar findings emerge from reviews of mainly Canadian research on technology integration in primary and secondary education (Ungerleider & Burns, 2002) and distributed and networked learning (Ungerleider & Burns, 2003). Our review of distance learning (Bernard et al., 2004, in press) also found the literature lacking in methodological rigor although we were able to conclude that pedagogical strategies, rather than media influences, enhance the effectiveness of learning at a distance. In a primary investigation, we (Sclater et al., 2004) found promising evidence of gains in standardized reading measures when technology was used intensively in the first year of a multi-year laptop integration programme. At the postsecondary level, we (Lowerison et al., in press, 2004) found a significant relationship between perceived course effectiveness and student-centred approaches to technology integration.

Collaborative learning. One means to achieve effective learning with technology appears to be through active collaboration. Our reviews (Lou, Abrami, & d’Apollonia, 2001; Bernard, Rojo de Rubalcava & St. Pierre, 2000) and studies (Savard, Mitchell, Corso & Abrami, 1995; Bures, Abrami & Amundsen, 2002, 2002; Bures, Bernard & Abrami, 1997; Bernard & Lundgren-Cayrol, 2001) offer evidence that the effectiveness of small group learning extends to within-class computer use, computer-mediated communication, and distance learning as means to enhance engagement and meaningful learning.

Engaging software. The quality, completeness, and pervasiveness of educational software and technology learning tools have also been scrutinized. Coley, Cradler, and Engel (2000) surveyed the status of computer technology use in schools and found that drill-and practice forms of computer-assisted instruction are effective in producing achievement gains in students. However, more pedagogically complex uses of technology generally show more inconclusive results, yet offer promising and inviting educational vignettes. Coley et al. (2000) found that uses of technology for learning varied and included the distribution and retrieval of information, communication, and courseware designed to provide instruction. Unfortunately, the California Instructional Technology Clearinghouse has rated only six to eight percent of evaluated courseware as “exemplary”, and from 33 to 47 percent as “desirable”. Less than half of the courseware submitted to the Clearinghouse had sufficient quality to merit review. In contrast, Tucker, Abrami, Schmid, Lacroix, Therrien, & Lopez (under review) found that complex tutoring software for early literacy developed by us significantly enhanced the standardized reaching achievement of young children learning to read.

Professional development.

In a recent survey of connectivity and technology integration in Canadian elementary and secondary schools, Plante and Beattie (2004) found that the overall ratio of students to computers is now five to one in Canada with Québec schools slightly less than six to one. Almost all principals reported that their schools used computers for educational purposes such as activities directed towards lesson preparation, execution, or evaluation during the 2003-2004 school year. At the same time, slightly more than half the principals were unable to report that the majority of their teachers had the necessary qualifications to effectively engage learners in using technology to enhance their learning. Wozney, Venkatesh and Abrami (in press) also demonstrated
the need for professional development to encourage more teachers to use technology as a classroom tool for problem-solving and critical thinking.

Technology, learning processes and portfolios

Using technology in the classroom should change the way that instruction occurs if we are to move away from teacher-directed instructional methods to the student directed methods. These socio-constructivist methods, which encourage inquiry, problem solving, and collaborative methods of learning emphasize the acquisition of a new set of skills and knowledge. Across North America, the curriculum is constantly changing, and yet critics charge that assessment techniques have not kept pace with these changes (Hillyer & Lye, 1996).

Our traditional methods of student assessment do not seem to wholly or readily account for these new skills, nor are they readily equipped to measure the deeper cognitive processes, like problem solving and critical thinking, that should evolve as a result of technology use. Nor do traditional assessment methods readily allow students to demonstrate their new knowledge in multiple forms such as through the use of multimedia. Traditional forms of assessment sometimes leave students feeling powerless, disempowered and confronted with performance pressures when taking tests (Culbertson & Jalongo, 1999). Most traditional assessment methods do not normally give students the chance to explain what they know and what they can do (Culbertson & Jalongo, 1999). Critics also argue that traditional assessment does not reflect comprehensively current theories in learning, does not give a clear representation of students’ true performance and provides little usefulness for the future (Chen & Martin, 2000). This calls for the use of classroom/teacher assessment tools that are better suited to providing a more accurate representation of student ability which do not stigmatize learners but better engages them in the learning process. For assessment to be effective, it should present students with multiple opportunities to apply their knowledge in different situations (Hillyer & Lye, 1996). Such integrative and honestly representative forms of assessment are termed authentic. This idea of authentic assessment is deeply rooted in the theoretical direction of hermeneutics, which advocates a more contextualized and collaborative approach to assessment. “Like psychometrics, hermeneutics is a general approach to the interpretation of human products, expressions or actions” (Moss, Schutz, and Collins, 1998). It provides a context for combining information across multiple pieces of evidence rather than relying on a sole source of evaluation.

In light of these theoretical changes in our education system, it has become necessary to create new integrative classroom/teacher assessment practices and teaching tools that can scaffold the learning process and provide a means of achieving authentic assessment. One tool that has been established as an authentic assessment tool is the portfolio. A portfolio can be defined as a purposeful collection of student work that tells the story of a student’s effort, progress and/or achievement in a given or in several areas (Arter and Spandel, 1992; MacIsaac and Jackson, 1994). According to Barrett (2003), a portfolio is not a “haphazard collection of artifacts but rather a reflective tool that demonstrates growth over time.” (p.3) Miller and Legg (1993) define portfolio assessment as a specific form of authentic or performance assessment that attempts to measure higher order thinking skills including the ability to communicate clearly, to make judgments, and to demonstrate specific competencies. Resnick (1992) describes portfolios as not being direct assessment measures, since they preserve the complexity of the cognitive skills being assessed rather than decomposing it into smaller components.

The Quebec Education Programme (QEP) (Ministère de l’Education du Québec, 2000) is based on the fundamental belief in the value of portfolios and requires teachers and students to develop proficiency with them. Consequently, the use of portfolios has been mandated within the elementary Language Arts curriculum and is encouraged in other core subject areas. The QEP lists the following as possible advantages of portfolios: involves students in their learning (as a tool for reflection); allows students to increase their ability to self-evaluate; teaches students to make choices; encourages students to better understand themselves and focus on their strengths; allows students to reflect on their procedures, strategies, and
accomplishments so that they can improve and correct them and ultimately succeed; promotes feedback during the learning process, particularly during individual conferences; encourages students to reflect on their strengths, needs, errors, interests, challenges, and objectives; encourages interactive processes among students, teachers, and parents; shows student progress because it tracks performance over time; and is used to assess competencies developed by students.

Types of Portfolios.

In the past, portfolios were collections of work assembled into boxes or binders. Digital portfolios provide a new kind of container where work is stored in digital form. Beyond the container, portfolios can be categorized according to the purpose that they serve. Danielson and Abrutyn (1997) identified three main types of portfolios: working, showcase and assessment. Working portfolios contain works in progress and are usually temporary because students move on to either an assessment or showcase portfolio. Showcase portfolios exhibit the student's best work. They are generally used to demonstrate the level of accomplishment that the student has attained. Students often use showcase portfolios during college applications or for professional employment purposes. Assessment portfolios are structured and standardized with "the content of the curriculum determining what students select for their portfolios" (p.5).
Digital Portfolios.

Because of their ability to store and process large quantities of content, and because they can personalize material, computers are an effective tool for developing and storing portfolios. These computer-based portfolios are called digital or e-portfolios. Our research (Kakkar, Abrami & Zitkute, under review) and development (CSLP, 2004) on digital portfolios is directly tied to these pedagogical changes, in particular to the QEP and to Québec society’s need to improve learning skills to meet the personal and employment challenges that are linked to rapidly changing technology, the globalization of both knowledge creation and transfer, as well as to economic activity.

Digital portfolios possess several advantages over their traditional “paper” counterparts. Some of the general benefits of digital portfolios include minimizing physical storage space, increasing portability, lengthening shelf life, increasing technology skills, and that they are learner-centred (Barrett, 2001). The pedagogical benefits of digital portfolios however, stem from the processes involved in creating them. The QESN-RÉCIT (Québec English Schools Network Réseau de personnes ressources pour le développement des Compétences des élèves par l'Intégration des Technologies) (2004) identifies five stages to the portfolio process, for print-based or digital portfolios, (1) collection, (2) selection, (3) reflection, (4) evaluation and (5) celebration. These stages are analogous to those laid out by Danielson and Abrutyn (1997) for developing portfolios. In the collection stage, teachers and students work together to save artifacts that represent successes and opportunities for growth. In the selection stage, teachers and students review and evaluate the saved artifacts and jointly decide which of those artifacts best demonstrate the achievement of learning goals. At the reflection stage, students articulate their thinking about each piece in the portfolio. Students evaluate their own growth over time as well as discover any gaps in their development. This stage is undoubtedly the most crucial and it is what enables portfolios to become lifelong learning tools. In the evaluation stage students compare their reflections to their pre-set goals and other achievement standards and indicators and set learning goals for the future. Finally, in the celebration, or as Danielson and Abrutyn (1997) call it, the presentation stage; students share their portfolios with their peers. “This is the stage where appropriate public commitments can be made to encourage collaboration and commitment to professional developments and lifelong learning.” (Barrett, 2001)

Pedagogical value and potential benefits of portfolios.

Proponents of sociocognitive models emphasize that to develop effective self-regulated learning strategies, “students need to be involved in complex meaningful tasks, choosing the products and processes that will be evaluated, modifying tasks
and assessment criteria to attain an optimal challenge, obtaining support from peers, and evaluating their own work” (Perry, 1998, p.716). Educators believe that portfolios allow students to think critically, and become active, independent and self-regulated learners (Perry, 1998; Mills-Courts & Amiran, 1991). When students use portfolios, they assume more responsibility for their learning, better understand their strengths and limitations, and learn to set goals (Hillyer & Ley, 1996). Students set their own learning goals and then are responsible for producing evidence that they accomplished these goals (Ricci, 2000). Wade and Yarbrough (1996) elaborate on the pedagogical value of using portfolios as a learning tool. Portfolios are developmental in their nature, since a portfolio represents a certain period of students’ growth and learning. Portfolios should not be solely used for short-term goal attainment since they are the culmination of long-term learning outcomes. Portfolios are dual-valued in that they offer both the teachers and the students the opportunity of dyadic interaction. A portfolio allows the student the opportunity to reflect and record learning process while offering teachers an authentic integrative approach of evaluating student growth and achievements as well as acting as a feedback mechanism for their teaching practices. Portfolios help students become involved in the evaluation of their own learning (Fenwick & Parsons, 1999). Given that the use of portfolios allows students to choose and organize the kind of content they want to include, this engages the students in the evaluation and assessment process. Contrary to traditional testing methods, which do not readily reflect student growth, portfolios may demonstrate learning gains and thus promote authentic learning. Portfolios are also interactive in that they enable students to share their work with their teachers and peers, thus seeking guidance or suggestions. In this way, the development and establishment of the portfolio may be seen as a form of collaboration (Wade et al., 1996). Portfolios also foster communication and collaboration among students, teachers and parents (Micklo, 1997).

Finally, portfolios can provide evidence of student self-regulation (Kakkar & Abrami, under review). Students may review their own work and then modify learning goals as a result of such reflection. The process of reflection is what makes portfolios a tool for life-long learning and professional development rather than a mere collection of work (Foote & Vermette, 2001). The student needs to be able to make a direct connection between each submission in the portfolio and an intended learning goal. The student needs to be able to explain why a specific submission was placed within the portfolio. Barrett (2004) further confirms the importance of this idea when she says, “the artifacts need to be accompanied by the learner’s rationale, or their argument as to why these artifacts constitute evidence of achieving specific goals, outcomes, or standards.” (p.3.) Bereiter and Scardamalia (1989) mention that portfolios encourage the pursuit of personal cognitive learning goals, what they call intentional learning. Portfolios prompt students to look back, to digest and debrief, and to review what happened so that they can set new goals and determine next steps (Camp, 1992). In an attempt to demonstrate the effects of reflection, Sweidel (1996) asked students self-reflective questions about their study strategies and found that at the end of the semester they were able to identify relationships between the process and the outcome of their studying.

Digital portfolios have unique advantages over paper-based ones. First, learners can easily integrate multimedia materials, allowing them to use a variety of tools to demonstrate and develop understanding. This may be especially advantageous for at-risk children whose competencies may be better reflected through these authentic tasks. At the same time, by engaging these learners, their deficiencies in core competencies may be overcome. Second, digital portfolios are superior for cataloguing and organizing learning materials better illustrating the process of learner development. Finally, digital portfolios have communication advantages. The portfolio is easy to share with peers, teachers, parents and others, and lets them provide feedback through a single electronic container. Consequently, we hypothesize that the use of digital portfolios will advantage students at-risk of school failure.

**Students with special needs**

Many teachers believe that at-risk students and those with learning disabilities stand to gain the most from the integration of technology. In his study of at-risk high school
students in urban schools in the United States, Pugalee (2001) found that the use of technology, along with an increase in teacher-student discourse, had a positive impact on student learning in mathematics. Ross and Lowther (2003) found similar results in their evaluation of a technology-rich school reform. This study revealed that the increase in technology use as a result of this program resulted in the use of more active learning strategies and that the experimental group surpassed the control group on assessment measures (Ross & Lowther, 2003). The most significant finding of the Ross and Lowther study was in the increase of parental and community involvement in the school.

**Digital divide.**

Digital portfolios also have the advantage of addressing yet another pedagogical difficulty we face in our classrooms; the digital divide. Looker and Thiessen (2003) found that males are more likely to use computers, the Internet and to enter fields of study related to ICT. Ungerleider & Burns (2002) suggest that these differences in use could be attributed to the software most commonly used in schools, which does not appeal to girls as much as it appeals to boys. Thus, we suspect that the appeal of technology will help male students, especially those at-risk, when they are engaged in the use of digital portfolios.

But we also believe that digital portfolios will encourage females to learn using technology. Because they promote authentic learning activities that encourage self-regulation and reflection, portfolio processes should be appealing to female students. Consequently, we hypothesize that both male and female students will benefit from the use of digital portfolios.

**CSLP's e-portfolio software**

The CSLP at Concordia University has recently released their innovative, bilingual software designed to support the portfolio process in elementary and early secondary schools (see Figures 1–3). The design of the software is the result of a collaboration with Québec school board administrators, teachers, students and the QESN-RÉCIT.

e-portfolio enables students to (1) set learning goals (see Figure 4); (2) create, modify and save different versions of their work (see Figure 5); (3) self-reflect (see Figure 6) (4) conference with teachers, parents and peers on their work (see Figure 7); (5) select and justify items to be sent to the showcase; (6) view their showcase (see Figure 8); and (7) customize their interface for both the process and their showcase portfolio. The software is distributed free of charge to interested schools who wish to partner with the CSLP in performing research on the use of ePortfolios. During the first year of implementation, approximately 20 teachers from four school boards used e-Portfolio in their classrooms. Feedback from teachers and students was extremely positive. The software may be viewed at: [http://grover.concordia.ca/eportfolio/promo/](http://grover.concordia.ca/eportfolio/promo/)
PS2 - ePortfolio in schools

Figure 1. Splash Page

Figure 2. Student Environment
Figure 3. Personal Space

Figure 4. Learning Goals
PS2 - ePortfolio in schools

Figure 5. Create/modify Work

Figure 6. Reflections
Research Plans

The CSLP has submitted a proposal to find a three-year longitudinal study of the use and impact of eportfolio. This research has several objectives: to identify the nature of digital portfolio use (quality and quantity), and discover necessary improvements for the tool and additional ways to promote teacher professional development within the tool; to measure the impact of digital portfolio use on key processes such as self-regulation, motivation, collaboration and problem-solving skills; to measure the impact of digital portfolio use on such important learning outcomes as literacy skills; and to look especially at at-risk students, students with special needs and male and female students.
Hypotheses

The use of digital portfolio software, in particular, the CSLP’s e-portfolio tool, will enhance both teaching processes, via targeted professional development, and learning processes, especially for male and female students at risk of school failure and students with special needs. The use of e-portfolio will have a positive impact on a learner’s ability to collaborate, to self-regulate, to problem-solve and to be motivated to learn. The use of e-portfolio will increase student scores on standardized tests (such as on the written constructed response sub-tests of the Canadian Achievement Test) and end of cycle tests in literacy, especially over time. The use of e-portfolio will be an effective and reliable measure for assessing student learning.

To this end, we will explore the nature of e-portfolio use by teachers and students. This will shed light on whether differences in the quantity and quality of use of the tool impacts student learning. This exploration will also help inform further development of the tool as well as provide information on teacher needs for professional development. We also hope to establish the impact of digital portfolio use on such key processes as self-regulation, motivation, collaboration, self-reflection and on the development of problem-solving skills. Finally, we will explore the impact e-portfolio has on important learning outcomes especially in the language arts, more specifically on writing skills.

Description of Expected Outcomes/Benefits

We expect that digital portfolios will enhance teaching and learning processes especially for students at-risk of school failure. We expect that teachers using e-portfolio will become more expert users because of the scaffolding provided in the professional development that will be embedded in and linked to the tool. We expect that the use of e-portfolio will benefit students by (1) enhancing motivational and cognitive benefits due to the use of multimedia for learning; (2) increasing the development of ICT skills; (3) improving accessibility to school work from remote locations; (4) enhancing communication with parents about school performance, which will increase parental involvement in the child’s learning; and (5) increasing the flexibility of carrying forward school work from year to year and therefore truly monitoring individual student learning gains over time.

We believe that digital portfolios may help reduce the digital divide by closing the gaps due to gender, ethnicity, and geographic location (such as rural vs. urban setting). We also expect that e-portfolio, by providing authentic tools for assessing progress and emphasizing individual efforts to learn, may be especially useful for impacting on these learners and especially those with special needs or who are at-risk of school failure. In general, the research and development activities will enhance our understanding of whether and how to use digital portfolios as a means to enhance students’ core competencies, especially those at risk, and as a means to provide authentic assessment of those competencies.

Finally, we believe that our approach to research, development and dissemination, which focuses on evidence-based practice, provides opportunities for our partners, in particular, and the educational community, in general, to have active input into all phases of the project. It will also provide them with ownership over the outcomes and genuine opportunities to reap the benefits of effective pedagogical practices aimed at increasing literacy and preventing of school dropout.

We welcome others to use our tool and partners with us in research and development.

Selected References


The impact of ePortfolio on CPD

ePortfolio: a way to touch all health and social care staff

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Abstract: “Every member of NHS staff eager to train will be entitled to individually-tailored professional development programmes through the new NHS University” (¹NHS 2002). An ePortfolio pilot is currently being scoped for NHSU, the corporate university for health and social care, to demonstrate that such a system will help achieve the ambitious aim of touching all 2.5 million people who work in or for health and social care, especially amongst those groups who traditionally receive little, and more worryingly, expect little personal development.

Key words – health and social care; personal development; widening participation; ePortfolio

Introduction

Over the past few months there has been an upsurge of interest in the concept of ePortfolios as a tool to support learners, their teachers, their employers and prospective employers. The concept of an ePortfolio is not new; there have been many pilot projects in this area since the mid-1990s. In fact ePortfolios are a key part of many UK undergraduate medical degree courses, most notably at Edinburgh and Newcastle Universities and the Royal College of Nursing (RCN), the largest professional body in the UK provides an ePortfolio system to its 350,000 members to manage their ongoing CPD and legal registration requirements. However, it is only recently that the notion of an ‘ePortfolio-for-all’ has really begun to gain momentum both in the UK and in mainland Europe. Perhaps the recent decision by the Welsh Assembly that every Welsh citizen will have an ePortfolio is the first manifestation of this.

On the European front the recent creation of Europortfolio will provide an added impetus to these developments. Europortfolio is a European consortium which aims to:

“Promote innovative practice and technology, and encourage the adoption of technical standards that will enable interoperability, between various ePortfolio systems (centralised or networked), and between ePortfolio systems and other information systems in order to maximise the number and quality of services that can be offered to ePortfolio owners”.

(²Europortfolio web site)

In addition the EC funded European Portfolio Initiatives Co-ordination Committee (EPICC) has been set up and is dedicated to making Europe a world leader in the field of ePortfolio activities in all sectors of education and training.

Recently a number of national initiatives have begun to look at the opportunities that ePortfolios might bring to different stakeholders. The two most important are the UK’s Department for Education and Skills (DfES) recent e-Learning strategy consultation (³DfES 2003), which sought views on, amongst other things, actions to unify learner support via an ePortfolio as a learner-centred, portable tool for the lifelong learner. In the initial analysis of responses to this consultation (³DfES 2004) 30% of respondents commented favourably on the concept of an ePortfolio, although 12% were concerned about the privacy aspects. The other, and arguably more significant, development is
the recently published interim report by Mike Tomlinson on 14-19 curriculum and qualifications reform (Tomlinson 2004).

The vision of the Tomlinson working group as set out in their summary to the report is:

“Our interim report sets out proposals for the 14-19 phase characterised by inclusiveness, challenge, quality and choice, where all students are able to achieve qualifications which reflect their very best performance.

Our proposals are designed to recognise the achievement of all 14-19 year olds with a unified framework of diplomas. This means providing valued qualifications which give recognition and status to a range of types and modes of learning and achievement (inclusiveness), and provide stretch throughout the system for all learners, but especially for high achievers (challenge).

The framework is unified, not uniform. The experience of each individual will be personalised, with young people able to make effective choices to follow routes which best suit their interests, needs and aspirations.

The framework will:

- ensure all young people develop the knowledge, skills and attributes they will need for success in later learning, employment and adult life;
- ensure coherence, structure and relevance within all young people’s 14-19 learning programmes;
- offer all young people flexible and valued progression opportunities; and
- reduce the assessment burden associated with current qualifications.”

Arguably the only way to effectively implement such a radical reform to qualification is via an ePortfolio and such an approach is being actively supported by the Working Group’s employers’ consultation forum. I would argue that the 14-19 Working Group’s vision as described above could very easily be seen as an NHSU vision for health and social care with little change to their wording.

An excellent summary on ‘where we are today’ in terms of strategic Government ePortfolio and related initiatives in the UK can be found in a document by John McCann from the Office of the e-Envoy (McCann 2003).

An ePortfolio

In the introduction to the ePort Consortium’s Electronic Portfolio White Paper (ePort Consortium 2003) the consortium, a group of US universities and associated institutions such as eCollege Inc., Educause, AAHE and Blackboard, state:

- “Today’s electronic portfolio, or ePortfolio, is much like the Course Management System (CMS) [Managed Learning Environment (MLE) in UK HE parlance – my comment] of 1997 – there is not yet a coherent understanding of functional requirements, design specifications, or how to and to what extent an ePortfolio might benefit teaching and learning. CMS software did not receive wide acceptance until its usefulness and functionality could be justified and until it became easy-to-use and offered services unavailable from existing systems. Until the ePortfolio software environments can similarly demonstrate their effectiveness, ease-of-use, and transparent integration, they will not reach the level of acceptance that the CMS has received in the past few years.”

Although this was written in November 2003 and much of it is still true, especially the lack of a coherent definition of an ePortfolio, many areas have moved on:

- There are a number of software suppliers providing ePortfolio tools, several of which are active in the health and social care field.
- The recognition that transferability of data and interoperability between systems are key requirements for ePortfolios to be available to all. The development of the UK lifelong learning profile (UKLeaP), BS788 (BSI 2004)
and work being done by the IMS Global Learning Consortium on an ePortfolios specification are just two examples of this.

- The number of projects being funded in this area, especially those being funded by the Joint Information Systems Committee’s (JISC) Managed Learning Environments (MLEs) for Lifelong Learning programme (JISC).

Although there is currently no agreed definition of an ePortfolio by the many and varied interested players in this area we can achieve an understanding within an NHSU context if we identify the potential stakeholders and define the benefits of an ePortfolio to them. However, before doing this a number of axioms on which an NHSU ePortfolio system is likely to be predicated need to be stated.

The content and use of an ePortfolio must rest with the individual learner. An ePortfolio must be able to:

- record achievement – the ability to demonstrate a learner’s skills and abilities is arguably more important to the NHS and its patients than the ability to confirm a learner’s knowledge.
- be a repository for evidence to support a learner’s achievements, both assessed and non-assessed
- provide a way for the learner to reflect on their learning activities and aspirations.
- Be capable of sharing data, subject to the first axiom, with other interested parties, e.g. tutors or employers and their systems.
- Be capable of importing data, e.g. for new joiners, and exporting data, e.g. for leavers.

**Stakeholders**

Within the above context who are the potential stakeholders and what are the benefits to them within the UK’s health and social care community? The key stakeholders that NHSU should address by implementing an ePortfolio system might include:

- Patients
- Professional bodies, e.g. Royal Colleges, and unions
- Examiners and assessors
- Teachers, lecturers or tutors
- Employers
- Learners

**For patients the benefits are:**

- A more skilled workforce
- A more committed workforce
- A workforce achieving its potential rather than settling for the status quo.

**For health and social care professional bodies, e.g. Royal Colleges and unions the benefits are:**

- A way of managing their members CPD and on-going registration requirements.
- A tool to support the introduction of new material and new ways of learning into their members’ CPD curriculum.
- A way for them to be seen as pro-active in the ongoing professional development of their members

**For the examiner or assessor the benefits are:**

- The ability to see evidence of a learner’s achievements and practices, either authenticated or not as required.
To negotiate with the learner the appropriate evidence required for a particular purpose.

The ability to assess and examine when appropriate for the learner rather than as dictated by a rigid prescribed timetable.

**For the teacher, lecturer or tutor the benefits are:**

- A tool to monitor a student’s progress.
- A way to support individual students in an individualised manner
- A tool to support collaboration in teacher-to-learner and learner-to-learner modes.

**For the employer the benefits are:**

- A means of knowing the skills, abilities and qualifications of all members of staff if integrated with the ESR
- A tool to assist in workforce development and planning
- A tool to assist in the integration of new joiners to the NHS and social care employers
- A key enabler for e-recruitment

**For the learner the benefits are:**

- A lifetime tool to record, either directly or with embedded links, and manage personal achievements be they formal qualifications, examples of work, significant learning artefacts, learning experiences all in the most suitable media format – text, video, audio, web pages, etc.
- A way to reflect on learning, aspirations, achievements and failures to enable goals to be set and learning plans to be created.
- A way to share experiences, achievements and reflections with others, but always under the learner’s control.
- A marketing tool for the creation of CVs and tailor information to potential employers.
- Creation of evidence for Accreditation of Prior Learning (APL), Accreditation of Work Based Learning (AWBL) and Continuing Professional Development (CPD) purposes which can be electronically submitted for formal accreditation where necessary.
- A secure repository.

**Where next:**

Now is a particularly opportune moment to be looking at ePortfolios within health and social care as it coincides with the introduction of the NHS Knowledge and Skills Framework which:

“defines and describes the knowledge and skills which NHS staff need to apply to their work in order to deliver quality services. It provided a single, consistent, comprehensive and explicit framework on which to base review and development for all staff.” ([Department of Health 2004](#))

Planning is now underway to run an ePortfolio pilot in an NHS Trust. The likely Trust serves a population of almost 200,000 and has approximately 2,600 staff of which 2,000 are qualified medical staff, 300 are professional support staff and managers and 300 are non-qualified support and manual staff.

Although the pilot will be aimed at all staff in the trust the focus will be on how an ePortfolio can be used to re-engage that significant portion of staff that traditionally gets little or no training and, more worryingly, do not expect any.

The pilot will specifically be looking at what is needed to:

- encourage lapsed learners to re-engage with personal development
support such staff in developing and recording their work-based learning
provide a viable support infrastructure to make learners feel that their effort is worthwhile

It will also need to address:

- Stakeholders:
- Management
- Staff (it is essential for any ePortfolio system that it is seen as being a learner’s system and not a management tool being imposed).
- Unions (the support of Union learning representatives is key)
- ESR (a new electronic staff record system which is being rolled-out throughout the NHS)
- NHSU regional office
- NHSU IAG
- System

No decision has yet been made as to the actual system that will be used for the pilot. However, it will need to be based on a modular in architecture, very customizable and conformant to the appropriate standards and specifications, e.g. UKLeaP (the UK Learner Application Profile being developed as a BSI standard) and the imminent IMS ePortfolio specification.

- Timescale

It is hoped to have the pilot up and running during Q1 2005.

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e-Portfolio for Masters level Students

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Abstract: This project focuses on the exploration of e-Portfolios for Masters degree (postgraduate level) students. A total of 3 pilots were conducted during January 2003- April 2004. For all the pilots the e-Portfolio comprised 3 components namely, Resume/CV, Personal and professional goals, and a Competency audit. All students were asked to provide feedback on aspects regarding their educational and technological experiences as well as recommendations for improvement.

This paper reflects the professional development benefits as well as the implications for life long learning the e-Portfolio can provide. The paper also analysis the least valuable aspects and recommendations for the development and implementation of e-Portfolios for Masters degree (postgraduate level) students.

Keywords: Reflective tool; life long learning; e-Portfolio; professional development; career development; job application

Introduction and background to the project
This project focuses on the exploration of e-Portfolios for Masters degree (postgraduate level) students at the Graduate School of Business at Curtin University of Technology in Perth, Western Australia.

The Graduate School of Business (GSB) offers Masters degree Programs to MBA (Masters of Business Administration) and MLM (Masters of Leadership and Management) students. During 2002, the e-Portfolio was introduced in the MLM and the Nursing Corporate Development Program mainly:

- To be consistent with and enhance the MLM philosophy of facilitating self-awareness through reflective discovery methods
- To develop leadership potential to empower others
- To challenge students to test their own philosophical and ethical paradigms.

An additional benefit is that the students can, after completion of the MLM degree, use the e-Portfolio for professional development benefits as the e-Portfolio will provide them with a cutting edge document that is currently in demand. Students will also be able to implement the knowledge, skills and experience gained from the e-Portfolio process for the process of lifelong learning in their chosen careers.

Aims of the project
The aims of the e-Portfolio were to develop and implement an e-Portfolio that will:

- Encourage reflective learning throughout the Masters degree leading to life long learning
- Assist students at the end of the course in job application

This web-based tool will allow the student to illustrate and provide evidence of their goals and development during LD 510 (and possibly during the MLM course), and does not simply reflect the highest level of achievement. This e-Portfolio is a thoughtfully organised collection of evidence that illustrates knowledge, skills and experience as well as personal and professional growth.

The research aim was to obtain feedback from the students regarding their educational and technological experiences (the most and least valuable aspects of the e-Portfolio; the key insights) as well as recommendations for improvement of the e-Portfolio.
A portfolio is a product as well as a process (Salend 2001). As a product, the portfolio is a comprehensive and unique collection and display of individual goals (short and long term), personal and professional growth and development, and achievement as well as evidence of that achievement including professional and personal attributes. As a process, the portfolio is a dynamic, non-linear and complex and thought provoking process of self-reflection, self-evaluation, short and long term planning and goal setting, as well as decision-making. By using a cycle of setting short term and long term goals, trying to meet those set goals, obtaining and providing evidence for achievement, and revising those set goals through self-reflection, the e-Portfolio development can assist in the student personal and professional growth and development (Salend 2001; Barret 2000; Wolf and Dietz 1998; Winsor 1998). This process has many other advantages that are discussed later in this paper.

Kimball (2002) suggests that portfolios should represent a coherent and thoughtfully though through collection that is an incremental display of what has been created and achieved over a period of time. As the portfolio needs to provide insights into the development process of the student, it should be purposeful rather than compiled at random. The portfolio should represent the process of reflection and growth and should not just be a scrapbook that provides snapshots of accomplishments.

3.1 Advantages of the Portfolio and e-Portfolio

Illustrated and discussed below are a few key advantages of the Portfolio and e-Portfolio. However, note should be taken that there are numerous other advantages of the Portfolio and e-Portfolio not included in this paper.

3.1.1 Acts as a tool for job applications

Chappell and Schermerhorn (1999), Kimeldorf (1999 a) as well as Denzine (2001) stated that as the e-Portfolio demonstrates a person's accomplishments it becomes a valuable tool for job applications as well as for application for promotion. Fennel (1998) states that the e-Portfolio is rapidly replacing the traditional resume as a job application tool. As the portfolio allows for the opportunity to weave different strands of personal and professional life into a compelling story, it will convince others of the potential worth of the person. According to Magill and Herden (1998), the e-Portfolio acts as the signature of a person and can demonstrate the person’s range and depth of competencies.

3.1.2 Provides a foundation for career-long self directed professional development

Fennel (1998), argues that the e-Portfolio allows persons the opportunity to identify patterns emerging in their areas of study and interest. This helps them to identify and take better advantage of the opportunities on offer during their study program and also opportunities available elsewhere. The e-Portfolio also brings a greater clarity of purpose and a higher level of motivation to the person. According to Carney (n.d.), the e-Portfolio can be regarded as a mirror and a map. The e-Portfolio allows the persons to through self-reflection view themselves, to show a plan for learning and development.

In addition, Barrett (2000 b) argues that the portfolio can document evidence of competencies and can guide long-term professional development. The competencies may be linked to national or international standards and used as a guide for further professional development. The portfolio provides a very powerful tool to demonstrate growth over a period of time and the portfolio encourages life-long learning. The responsibility for career-long dynamic and continued personal and professional growth and development lie with the person (the individual). Peers, facilitators and educators will assist the person in this process but the person remains responsible as the main owner and driver of this process. Through the e-Portfolio, the person as an adult and life-long learner takes on the responsibility and ownership for learning, growth, development and competency. The e-Portfolio
encourages and enhances self evaluation and self reflection as learners as well as foster and promote critical and creative thinking, analysis and decision making competencies.

3.1.3 Provides a record of goals, growth, and achievement.

According to Chappell and Schermerhorn (1999) and Denzine (2001), the e-Portfolio depicts a person’s accomplishments to date. Therefore, it acts as an important feedback tool and is helpful for reinforcement, motivation, personal development and goal planning. Corbett Perez and Dorman (1999) stated that the e-Portfolio provides the opportunity to a person to evaluate his/her own learning and to progress toward clearly defined goals. The e-Portfolio does not only act as a record for goals but the act of creating the e-Portfolio stimulates critical thinking regarding the persons competencies and encourages goal setting abilities (Magill and Herden 1998).

Winsor (1998), argues that the professional portfolio is a record of goals, growth, achievement and attributes over a period of time. Important to note is that it does not only reflect the highest level of achievement. The portfolio is a testimony to acquired knowledge as well as personal and professional attributes. The e-Portfolio provides a dynamic, comprehensive, continuous personal and professional picture of who the person is, as well as what the person’s competencies are. It acts as a comprehensive tool in the process of a job application. Instead of just talking and providing outcomes such as diplomas or final marks, the person can through the e-Portfolio show actual examples of work or actual letters of recommendation.

It must be remembered that the e-Portfolio is a tool to reflect growth, development and achievement and not to determine and focus on incompetence. It provides a baseline to work from but also as a challenge and the opportunity to grow and develop on a personal and professional level.

3.1.4 Provides a framework for reflective thinking and self reflection

The first step needed to plan the person’s own personal and professional growth and development journey is self-evaluation through self-reflection. Reflection will assist the person to determine who the person are as a leader and help the person to plan on how to become a better and more effective leader. The portfolio provided a vehicle for this.

According to Magill and Herden (1998), Kimball (2002) as well as Hardin and Cook (2001), the compilation of an e-Portfolio encourages the person to reflect and this act of reflection is very valuable to learning.

Hackney (1999) and Beck (1999) argue that a big advantage of the e-Portfolio is self-reflection, it is important that the creation of the portfolio takes into account the process of self examination and that this process should not be oversimplified. It should demonstrate the variety, depth and range of the person’s growth and achievements. Over time, this self-reflection affects and may also direct personal and professional choices and directions. The portfolio process can prompt practitioners to reflect on their practice on a regular and continuing basis (Winsor 1998; Barrett 2000 b).

As the e-Portfolio provides a framework for reflective thinking and self-reflection, it also provides a foundation for career-long self-directed professional development.

3.1.5 Encourages the use of technology

According to Chappell and Schermerhorn (1999), the e-Portfolio moves the responsibility for learning the technology of the e-Portfolio to the person. It is important that e-Portfolios (when implemented) are made mandatory if they were to overcome the resistance of many persons who remain technically adverse. Persons must not be allowed to opt out of the e-Portfolio because of their lack of computer competency. Persons must be encouraged to recognise, identify their technical shortcomings, and be allowed to catch up. It is important to provide support to these persons, for example through a computer assistant (Barrett 2000 b; Hartnell-Young and Morris 1999).
Carney (n.d) agrees that the e-Portfolio encourages the use and development of computer and technical skills but also states a clear warning that trying to learn how to use the computer and the technology and at the same time trying to reflect on learning, may lead to “cognitive overload” for the student. Outcomes of a study suggested that the student who took on the most challenging technological tasks related to his/her competency produced the least successful e-Portfolios. It seems that students, who are working at the limits of their computer and technological skills, may have very little cognitive energy and time left for reflection. These students may also have little time to achieve the important developmental and educational goals of the e-Portfolio. One solution may be to provide a template to the students that is easy to use and that is flexible enough to allow for individual creativity and not constrain the student’s capacity for self-expression.

3.2 Limitations

The advantages of e-Portfolios are clear and well described in the literature. However, it is also clear that there are definite limitations to the use of e-Portfolios. These limitations include:

3.2.1 Technical difficulties

Technical difficulties can be a lack of understanding or knowledge or that the person does not have access to the needed equipment to be able to develop and maintain an e-Portfolio or a simple resistance to breaking the paper-based habits (Galloway 2002).

3.2.2 Students not realising the connection between technology and the educational process

According to Galloway (2002), it is a fact that some students and educators do not realise the link between the use of technology and the educational process. Therefore, it is difficult for these students and educators to understand that the e-Portfolio can be used as a valuable tool to assist in the educational process of a student.

3.2.3 Privacy and ownership of the e-Portfolio

The student's portfolio needs to be secured to prevent plagiarism but at the same time be accessible to prospective employers. This can create some problems (Galloway 2002).

4. Description of the project

A total of 3 pilots were conducted in the timeframe of one and a half years (January 2003- April 2004). For all the pilots the e-Portfolio comprised of 3 components namely:

Resume/CV
Personal and professional goals
Competency audit based on the Learning outcomes

As this e-Portfolio was regarded as a teaching/learning e-Portfolio and not a document for job applications (but with the potential to be used for job applications), all the components were secured with access only to the student, technical support person and the educator responsible for the support to the student and the evaluation of the e-Portfolio. All students were asked to provide feedback on the same aspects regarding their educational and technological experiences (the most and least valuable aspects of the e-Portfolio; the key insights as well as recommendations for improvement of the e-Portfolio) to ensure that feedback between the pilots can be compared.

For pilots 1 and 2 the same learning outcomes (competencies) were used but due to feedback from pilots 1 and 2, the learning outcomes (competencies) were revised for pilot 3. (see Table 1)
As is evident (see Table 1) all the pilots included small numbers of students (maximum 32 students). This allowed the researcher to be closely involved with the students and to ask and analyse in-depth questions and feedback from the students.

During pilot 1 of the e-Portfolio, a short orientation/briefing session and a brief handout were provided to the students. The detailed information was provided in electronic format as part of the e-Portfolio. During the feedback from the students in pilot 1, it was clear that the students needed a more comprehensive orientation session. They also needed a hard copy of information that they can use to refer back to. This might be because there is an 11 week break between the briefing and the actual submission of the e-portfolio. Pilot 2 included the recommended improvements. Students stated that they found it useful that they had notes from the educator and their own hand written notes to revisit after the briefing. Pilot 3 took on board more of the recommendations that were suggested by pilots 1 and 2. These included recommendations to provide the students with hands on demonstration and some “practice time” during the briefing. These improvements resulted in pilot 3 being a great success.

See table 1 for a summary of the project.

Table 1: Summary of the project

<table>
<thead>
<tr>
<th></th>
<th>Pilot 1</th>
<th>Pilot 2</th>
<th>Pilot 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student group</td>
<td>MLM (n=20)</td>
<td>Nursing Corporate Development Program (n=32)</td>
<td>MLM</td>
</tr>
<tr>
<td>Software used</td>
<td>LearningSpace</td>
<td>MSWord</td>
<td>LearningSpace</td>
</tr>
<tr>
<td>Learning outcomes (competencies) used</td>
<td>Outcomes developed prior to December 2003</td>
<td>Outcomes developed prior to December 2003</td>
<td>Revised Outcomes of December 2003</td>
</tr>
<tr>
<td>Orientation session provided</td>
<td>Basic orientation session provided</td>
<td>Detailed orientation session provided including examples of e-Portfolios</td>
<td>Detailed orientation session provided including examples of e-Portfolios</td>
</tr>
<tr>
<td>Guidelines on how to complete e-Portfolio were discussed</td>
<td>Guidelines on how to complete e-Portfolio were discussed</td>
<td>Guidelines on how to complete e-Portfolio were discussed</td>
<td>Additional hands on demonstration and &quot;practice time&quot; were added.</td>
</tr>
<tr>
<td>Guidelines on how to complete e-Portfolio provided as a back up system</td>
<td>Detailed online only</td>
<td>Limited hard copy</td>
<td>Not possible for online guidelines</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Detailed online and detailed hard copy</td>
</tr>
</tbody>
</table>

This project is significant as it provides and in-depth insight into the educational and technological experiences and the unique needs of students at the Masters degree level that need to be incorporated in the development and the implementation of an e-Portfolio. It also includes recommendations from the students.

5. Implementation of the e-Portfolio at GSB

For all the pilots the e-Portfolio comprised 3 components namely, Resume/CV, Personal and professional goals, and a Competency audit based on the Learning outcomes.
5.1 Resume/CV

This includes the same information and format that will be included in a paper based resume/CV. In the Resume/CV the student could include letters of commendation, recommendation, thank you letters, publications, presentations, special projects, certifications, job descriptions, evaluations, volunteer and community activities as recommended by Koch and Koch (n.d.).

5.2 Personal and professional goals

It was described by Corbett-Perez and Dorman (1999), that the e-Portfolio provides the opportunity for Students to evaluate their own learning and to progress toward clearly defined goals and by Magill and Herden (1998) that the act of creating the e-Portfolio stimulates critical thinking regarding the students competencies and encourages goal setting abilities. Therefore, it was decided that the student should write his/her own personal and professional goals although there are overall GSB goals. The personal and professional goals should contain two sections namely:

For the MLM Program or the Nursing Corporate Development Program

For the Leadership Development (LD 510) unit

5.3 Competency audit

The competency audit is based on Graduate School of Business's generic learning outcomes used in all the units and LD 510 specific learning outcomes. For example, the e-Portfolio is implemented in LD 510 and it is possible to build on the e-Portfolio throughout the MLM and the Nursing Corporate Development Program.

Therefore, the student should find the GSB learning outcomes and the interpretation of each of those learning outcomes in the unit outlines of each of the units in the MLM. The student then supplements the specific learning outcomes of LD 510 with the specific outcomes of another unit (for example, Human Resource Management, Marketing).

A scale of 1-5 (where 1 means not reached at all and 5 means highly competent) was used for the evaluation of the different competencies. When the student allocates 1, 2 or 3 to a specific competency, plans for development of that competency should be described. When the student allocates 4 or 5, evidence of that competency must be provided. As LD 510 is usually the first unit for students in the MLM, the student cannot expect to obtain a 5 for all the ratings of the competencies required.

6. Research design and research method

The project consisted of both qualitative and quantitative data. The quantitative data consists of biographical data of the students. This included:

Age
Gender
Address (reside in the country or city)
Country of birth
Educational level and institution of education
Current area of employment

Quantitative data was collected from the student’s application forms and were analysed through the Statistical Package for the Social Sciences (SPSS). Although the project was done in such a way that a paper can illustrate and discuss the results of the biographical data through tables and figures by means of frequencies and/or percentages, this paper will only concentrate on qualitative questions of the project.

The project followed a qualitative paradigm that was descriptive, explorative and contextual in nature. The researchers explored and described the lived experiences
from students’ perspective. The qualitative data consisted of three questions. The students in all 3 pilots were asked the same question to ensure that the data can be compared between the 3 pilots. These questions were:

What were the most valuable aspects of the e-Portfolio experience?
What were the least useful aspects of the e-Portfolio experience?
In what ways could we have improved the e-Portfolio experience for you?

The qualitative data was analysed through QSR N6 a newer version of NUD*IST (Non-numerical Unstructured Data Indexing Searching and Theorizing).

A detailed analysis and discussion of the qualitative questions are summarised in the result section.

7. Student sample

Table 2 summarises the student sample for the 3 pilots.

Table 2: Student sample

<table>
<thead>
<tr>
<th>Pilot 1</th>
<th>Pilot 2</th>
<th>Pilot 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLM (n=20)</td>
<td>Nursing Corporate Development Program (credits provided for MLM) (n=32)</td>
<td>MLM (n=20)</td>
</tr>
<tr>
<td>A bachelor degree or equivalent, or Completed the Graduate Business Qualification (GBQ) through GSB. A minimum of 3 years work experience in at least one organisation. Two letters of recommendation from leaders in business, government and/or community. Met with senior academic staff at the GSB for an interview prior to being accepted in the program.</td>
<td>Preferably a Bachelor Nursing degree or equivalent. A minimum of 5 years work experience in at least one organisation. Two letters of recommendation from leaders in business, government and/or community. Applied through the Department of Health WA application and selection process for inclusion in the Nursing Corporate Development Program</td>
<td>A bachelor degree or equivalent, or completed the Graduate Business Qualification (GBQ) through GSB. A minimum of 3 years work experience in at least one organisation. Two letters of recommendation from leaders in business, government and/or community. Met with senior academic staff for an interview prior to being accepted in the program.</td>
</tr>
</tbody>
</table>

8. Results

Seventy two (72) students’ answers to the qualitative questions were analysed and the comments were grouped into categories. For example, a comment about how the e-Portfolio can be used for job application would be grouped within “job application”. Similarly a comment regarding the e-Portfolio promoting personal/professional growth would be grouped within “Promotes personal/professional growth”. Therefore, while the comments pertain to quite different factors, within the context of the project, these factors are both with regards to professional development. This is an important point to remember because comments by one student regarding two different factors may actually be grouped into the same category. Therefore, note that the frequencies referred to represent the number of times a particular category was reported.
8.1 Professional development benefits the e-Portfolio can offer

The professional development benefits the e-Portfolio can offer as indicated by the students in the 3 pilots are reflected in Figure 1 and the accompanying legend outlines the range of benefits put forward.

**Figure 1: Professional development benefits**

<table>
<thead>
<tr>
<th>Frequency of responses</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>43</td>
<td>20</td>
<td>13</td>
<td>5</td>
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<td>31</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

A discussion of each of these aspects as well as the supporting statements for each of the aspects follows.

**Self reflection**

It was clear from the literature that the compilation of an e-Portfolio encourages the student to reflect and this act of reflection is very valuable to learning. As the e-Portfolio is designed to focus on specific competencies, it encourages the students to reflect on strengths and weaknesses. It should demonstrate the variety, depth and range of the students' growth and achievements. The e-Portfolio encourages self-reflection and also increases the confidence of students (Magill and Herden 1998; Kimball 2002; Hardin and Cook 2001; Hackney 1999; Fennel 1998)

It is very insightful to note that in all 3 pilots in this study, the students rated “Self reflection” (Total frequency of responses was 43) as the most valuable aspect. Overall, self reflection also received the majority of the statements from students stating it is the most valuable aspect. Students also stated 46 times that the self reflection is one of the key insights the e-Portfolio has to offer making it the most mentioned key insight.

Students indicated that the e-Portfolio gave them the opportunity to reflect and acknowledge the amount of knowledge they obtained, the e-Portfolio also encouraged reflection on goals. The following statements reflect this:

“It has also allowed me the opportunity of acknowledging the amount of knowledge which I have obtained as a result of the class, group and individual work which have come together to form this module.”

“It was a good opportunity to reflect on the LD510 experience.”

“It was an opportunity to reflect further on my goals.”

According to feedback received from students in a PhD study conducted by Piper (1999), self reflection was also mentioned as the most valuable aspect of the e-
Portfolio. Students found the self reflection process where they valued the opportunity to critically examine their work to determine if they have reached the set criteria. Students stated that they were encouraged to self-assess and self-reflect on their learning within the framework of the e-Portfolio.

**Job application**

It is a well known fact from the literature by Chappell and Schermerhorn (1999), Denzine (2001) and Magill and Herden (1998) that e-Portfolios can be used as tools for job applications. In addition, Fennel (1998) argues that by placing the e-Portfolio online students increases their chances of obtaining employment. Twenty statements indicated that the students believe that one of the most valuable aspects of the e-Portfolio is the fact that is can be used for job application. The following statements from students support this:

“The e-Portfolio can be used in applying for jobs and may give us the competitive edge.”

“I would love to apply for a job one day with a relevant e-Portfolio - the sky is the limit, and I already have so much stuff on the computer that I could contribute.”

The feedback from this project reflected through a total of 14 statements that the fact that the e-Portfolio can be used for future job application was a key insight gained as was illustrated by the following statements from the students:

“I believe that by building an e-Portfolio at the start of your formal education would provide you with a powerful tool, which could be used to enhance your employment opportunities because of the detail and supporting evidence it can provide.”

“I feel confident knowing that I have a competitive edge using the e-Portfolio in future job applications.”

**Promotes personal and professional growth**

Students in the 3 pilots stated a total of 13 times that one of the most valuable aspects of the e-Portfolio is that it promotes personal and professional growth. The students found that the e-Portfolio promotes personal and professional growth by helping the students focus on why they are undertaking the MLM or Nursing Corporate Development Program.

It was also stated a total of 31 times that the students believe one of the key insights gained from the e-Portfolio is the idea that the e-Portfolio encouraged personal and professional development as it encouraged the students to reflect on their strengths and limitations and plan goals for further development. The following statements support this:

“The personal and professional goals was probably the most valuable area for me as it helped me focus on the reasons for undertaking the MLM and the benefits for myself and my employer.”

“The e-Portfolio has also allowed me to logically and realistically plan my continual development in the area of leadership development, since it has provided me with the opportunity to design a plan of action for achieving my goals in this area.”

**Integrated thinking**

It was stated on 5 occasions that one of the most valuable aspects of the e-Portfolio is the fact that it promoted integrative thinking among the students. Students also indicated that this aspect is a key insight gained from the e-Portfolio (n=12). (Note: for the key insight section “Introduction to new concepts/promotes integrated thinking” were grouped together). The students indicated that the e-Portfolio helped students to see the link between units already taken it also encouraged students to
think outside the box. It reinforced past learning and gave students the opportunity to compare performances and abilities. The following statements demonstrated this:

“To have to use my lateral thinking skills in seeking useful examples from prior learning. It reinforced past learning and was a means of revising what had been done in previous units and how they could be utilized in future learning.”

“The competency audit in particular highlighted the link between the units already undertaken and how they were started to form an overall picture that linked together to form one larger cycle of learning.”

Implication for lifelong learning

The implications for lifelong learning the e-Portfolio can offer as indicated by the students in the 3 pilots are reflected in Figure 2 and the accompanying legend outlines the range of benefits put forward.

Figure 2: Implication for lifelong learning

```
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can be used in future</td>
<td>22</td>
</tr>
<tr>
<td>Taught technical skills</td>
<td>17</td>
</tr>
<tr>
<td>Introduction to new concepts</td>
<td>20</td>
</tr>
<tr>
<td>Teamwork</td>
<td>10</td>
</tr>
</tbody>
</table>
```

A discussion of each of these aspects as well as the supporting statements for each of the aspects follows.

Can be used in future

Students in the 3 pilots made 22 statements that one of the most valuable aspects of the e-Portfolio is that it can be used in future. Although students stated that the e-Portfolio could be used in the future, they did not really specify what they are going to use the e-Portfolio for. (Students did state that the e-Portfolio could be used for professional use such as job applications, however this is categorised under the “job application” (n=20) category.) The following statements reflect that one of the most valuable aspects of the e-Portfolio is that it can be used in future:

“A very valuable and practical tool that will be used beyond this unit.”

“I can see long term benefits in building on the documentation that I have now started.”

The possibility that the e-Portfolio could be used in future was mentioned 8 times by the students as being an insight gained from the e-Portfolio. The following statements by the students demonstrated this:
PS3 – The impact of ePortfolio on CPD

“Useful and different tool to give yourself an edge over your competitors.”

“Gained a comprehensive framework to use as a guide for further study on leadership and management issues.”

It is also interesting to note that although statements with regards to the e-Portfolio being a great tool for job application was not categorised into this section this is also one of the uses the e-Portfolio can provide the students in the future (see “8.1 Professional development benefits the e-Portfolio can offer” for a discussion about the e-Portfolio being an excellent tool for job applications).

**Taught technical skills**

During discussions with the students early in the module, it was very clear that the majority of them have very basic technical and computer skills. It was mentioned 10 times by the students that the fact that the e-Portfolio developed their technical and technological skills was one of the valuable aspects of the e-Portfolio. Some of the students mentioned that this is a skill that they will value in the future. Technical/technological advantages were also mentioned a total of 20 times by students with regards to being a key insight gained from the e-Portfolio experience. The following statements illustrate this:

“Developed my understanding of the use of PowerPoint and the different functions of the computer for better presentation of any assignments or portfolios in future.”

“Developed patience and the phrase "save "and "save often".""

**Introduction to new concepts**

(Note: for the key insight section “Introduction to new concepts/promotes integrated thinking" were grouped together). Students stated that the e-Portfolio enhanced holistic thinking and thinking outside the square. This was reflected by a total of 12 statements stating that one of the key insights gained from the e-Portfolio is the fact that it encouraged exploring of new concepts. Furthermore 3 statements were made with regards to the students feeling that this aspect is one of the most valuable aspects of the e-Portfolio experience. The following statements by the students evidenced this:

“I found the experience interesting, something new to learn.”

“....a knowledge of a new product on the market- that may have application in other environments.”

“The importance of integrating new knowledge into the work environment and implementing it in new ways.”

**Teamwork**

Eight statements were made that one of the key insights gained from the e-Portfolio is the fact that it encourages teamwork. It is interesting to note that no statements were made with regards to this aspect being one of the most valuable aspects of the e-Portfolio experience. Students stated that as they were given the opportunity to work with people from different backgrounds this expanded their knowledge and understanding for people, which can be used in the future. Students also stated that teamwork gave them courage to confront an issue rather than side stepping the issue.

“Gained further appreciation of teamwork through the advice of other LD 510 members. It is all about actively utilizing the skills of all members of the team.”

“The gains in knowledge and understanding I have made from participating in teams which include people from a different working background to myself.”
8.2 Least valuable aspects and Recommendations

The least valuable aspects as stated by the students in the 3 pilots are reflected in Figure 3. Accompanying the least valuable aspect in Figure 3 is the recommendation related to the least valuable aspect. Some recommendations are not related to a certain least valuable aspect and vice versa. The accompanying legend outlines the range of least valuable aspects and recommendations put forward.

**Figure 3: Least valuable aspect and Recommendation**

<table>
<thead>
<tr>
<th>Code</th>
<th>Aspect/Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Technical difficulties</td>
</tr>
<tr>
<td>A</td>
<td>More technical detail</td>
</tr>
<tr>
<td>B</td>
<td>Difficult to find evidence</td>
</tr>
<tr>
<td>C</td>
<td>More examples</td>
</tr>
</tbody>
</table>

A discussion of each of these aspects/recommendations as well as the supporting statements for each of the aspects/recommendations follows.

**Technical difficulties/More technical detail**

It is important to take cognisance of the warning by Carney (n.d) who stated that trying to learn how to use the computer and the technology and at the same time trying to reflect on learning, may lead to “cognitive overload” for the student. It is evident that the student who took on the most challenging technological tasks related to his/her competency produced the least successful e-Portfolios. It seems that students, who are working at the limits of their computer and technological skills, may have very little cognitive energy and time left for reflection. These students may also have little time to achieve the important developmental and educational goals of the e-Portfolio. One solution may be to provide a template to the students that is easy to use and that is flexible enough to allow for individual creativity and not constrain the student’s capacity for self-expression.

Students stated a total of 16 times that one of the least valuable aspects of the e-Portfolio was the fact that the students had some technical difficulties. This was the most mentioned aspect with regard to being least valuable. The following are statements from the students from the 3 pilots:

“...had to worry about the technology rather then the content, which should not be the case.”
"I felt that the technical issues I faced were simply annoying, however much support from IT."

It was also recommended a total of 10 times that more technical detail should be implemented for future e-portfolios. It is interesting to note that this recommendation was only made by the students in Pilot 2. Numerous responses for “more technical detail” could imply that students had trouble with the technology. The following statements from students illustrate this:

“Because my computer skills are still reasonably basic, I had to spend longer than perhaps others to produce some simple power point presentations etc however, this is all part of the learning curve.”

“I felt that I would be unable to do more than an adequate presentation given my inadequate computer knowledge, skills and access to hardware and therefore, was not looking forward to it.”

Difficult to find evidence

A total of 9 statements from students in the 3 pilots indicated that one of the least valuable aspects of the e-Portfolio was the fact that they had to provide “good” evidence. This is sometimes difficult or impossible to do as the evidence is not readily available in electronic format, not available at all or some of the evidence from previous jobs was not accessible. Therefore, even though they felt that they were competent in a specific competency, it could not be rated as such as they did not have the evidence to attach to support this. The following statements from students in the 3 pilots support this:

“I think there is a gap between experience and evidence. I had done a lot of things in my work life experience that was done in the process of business. I did not have any documentation about it, so it was inadmissible. “

“Difficult to decide what constituted ‘good’ evidence. Difficulty finding evidence from previous work as not on disc/files easily found. Some evidence existed in previous jobs and therefore not accessible – apart from my work! I realise that now that I am aware of e-Portfolios I will add things to it as I go so will not face this problem.”

More examples

During the orientation session, students were provided with numerous examples of previous e-Portfolios and examples of aspects that could be included in the e-Portfolio. However, 6 statements from the students in the 3 pilots stated that they would have liked to have more examples that could be used for referral later in the semester. The following statements illustrate this:

“Maybe the two hours could have shown us more examples, talk specifics not just technical - where to find everything, but what to include, how it should ‘look’ and ‘feel’. I would like my next e-Portfolio to have more effects so classes on that would be great too.”

“To have a lecture inclusive of more presentations of e-Portfolios would give people a better understanding of what an e-Portfolio is, what is expected and what one actually looks like.”

9. Conclusion

It is evident from the statements made by the students in the 3 pilots that their e-Portfolio experience had some least valuable aspects. These included technical difficulties and the fact that it was hard to find suitable evidence (see Figure 3). However, there was overwhelming feedback from the students is that it is has a lot of positive advantages (see Figures 1 and 2 for a detailed analysis). These include:
The students also made some recommendations, which can be implemented to enhance the e-Portfolio experience for future pilots. These recommendations include:

**More technical detail**

**More examples**

**References**


Design, implementation and evaluation of a ‘generic’ ePortfolio: the Newcastle experience.

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Abstract: A customisable ‘generic’ electronic portfolio (ePortfolio) has been developed at Newcastle University as part of a collaborative FDTL4 project (http://www.eportfolios.ac.uk). This paper describes the design of the ePortfolio and its application in a range of contexts where it is being used to support the evidencing of learning outcomes and to facilitate personal development planning. The flexibility of the ePortfolio architecture is appraised and preliminary findings from evaluation studies are summarised. Integration with virtual learning environments is also discussed.

Keywords: electronic portfolios, personal development planning, virtual learning environments, reflective learning, learning outcomes

Introduction
Requirements for ePortfolios vary greatly between different contexts. They may serve different purposes including a range of formative, summative and presentational processes. Even in a single context, an undergraduate course for example, those requirements are likely to change over time. It is therefore important to design systems which are flexible and responsive to changes in curriculum and policy requirements (Cotterill 2004a). This paper describes a ‘generic’ ePortfolio framework, developed at Newcastle University, which has been designed to be highly configurable with the aim of having the flexibility to support diverse and changing requirements. The ePortfolio was developed as part of a collaborative project financed by the Higher Education Funding Council for England (FDTL-4 programme). The project is led by The University of Newcastle and involves The University of Leeds, The University of Sheffield and The University of Dundee.

Educational objectives

Personal Development Planning
One of the drivers for this ePortfolio project was the requirement for the implementation of personal development planning (PDP) in the Higher Education sector in the UK by 2005 (QAA, 2001). PDP is "a structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development" (QAA, 2001). The ePortfolio team at Newcastle has prior experience in developing electronic systems to support PDP. This includes two sequential Internet Personal and Academic Records projects (http://www.internet-pars.ac.uk) in collaboration with Nottingham University. The first of these projects was to support PDP in undergraduate students; the second was to apply this in the context of Continuing Professional Development (CPD).

Evidencing Learning Outcomes / Skills Development
Another key aim of the ePortfolio is to help support and promote reflective approaches for evidencing the attainment of programme outcomes. The focus of the FDTL-4 project is in undergraduate Medicine where there are growing requirements for reflective practitioners who have the skills and attitudes that are needed to meet the demands of professional audit, appraisal and professional revalidation:

“Students must receive regular and consistent information about their development and progress. Clinical logbooks and personal portfolios, which allow students to identify strengths and weaknesses and to focus their learning appropriately, can provide such information. Using these will emphasise the importance of maintaining a
portfolio of evidence of achievement, which will be necessary once they have become doctors and their licence to practise is regularly revalidated.” (GMC, 2002)

Similar requirements are seen in other vocational courses. Also, there are close parallels with the recording and evidencing of transferable ‘Key Skills’ in other subject areas. In modular courses portfolios may provide a focus on programme-level as well as module-specific learning outcomes. The portfolio process may help students become better at relating what they have learned to the requirements of employers.

**Supporting Life-long Learning**

ePortfolios can support life-long learning by supporting the electronic transfer of learning records. This means that prior learning and achievements are taken into account and then after graduating students can take their records with them into employment. More fundamentally, it is also intended that the process of completing the portfolio will itself encourage the development of skills necessary for life-long learning. As a student-centred process the portfolio is intended to encourage independent learning. PDP and the ability to evidence learning outcomes are also important life-long learning skills.

**ePortfolio architecture and design**

The ePortfolio has been developed using robust platform-independent Open Source tools (including Apache Web server, the ZOPE publishing environment and MySQL databases). At the design phase some of the potential ‘value-added’ features which an IT approach can bring compared to paper-based portfolios were considered.

Potential ‘value added’ features of ePortfolios:

- Highly customisable
- Multiple structures / views
- Sharable - facilitating interaction with supervisors, peers, and others
- Easier cross-referencing
- Searchable
- Integration with VLEs
- Transferable data to support life-long learning
- Reduced / enhanced admin
- Downloading records in a variety of formats
- Backup and reduced physical storage requirements

As far as possible these features were ‘designed’ in to the ePortfolio (Figure 1.) For example a common contents structure was designed to allow the portfolio owner the facility to share specific parts of their portfolio and to provide cross-referencing capabilities.
Course-level customisation

The ePortfolio was designed to be highly configurable. For example component tools for the portfolio can be selected by course and by year group (Figure 2). Context-specific tools can be incorporated into this framework, including structured Web forms generated by course administrators or more sophisticated tools created in-house or by 3rd party developers.

Nomenclature can also be customised at the course level (Figure 3.). For example ‘tutor’ or ‘mentor’, ‘learning outcomes’ or ‘key skills’ etc.
GenericType Tools

A number of ‘generic’ tools (ie. designed to be used in a variety of educational settings) have been developed to support PDP. These structured tools include a reflective learning diary, outcomes/skills log, CV, records of meetings with tutors, SWOT and an Action Planning tool. These tools incorporate an integrated action planning feature. Actions are associated with specific records but can also be viewed in a central ‘In-box’ in which actions can be sorted by deadline or priority.

Sharing

The framework allows sharing of specific content with supervisors, peers and others, with the facility for viewers to add formative comments. It supports sharing with external users who receive instructions and a password via Email when a student adds them to their ‘share list’.

Figure 3. Configuring the nomenclature: example from postgraduate dentistry

Figure 4. Portfolio owners can grant access to specific parts of their portfolio
Cross-referencing

Figure 5. Example of cross-referencing from a portfolio for Contract Research Staff

The generic framework supports the cross-referencing of different parts of the portfolio (Figure 5.). For example a record of a workshop can be cross-referenced with one or more learning outcomes or skills. In this example the user can state how the workshop they attended was relevant to a skill and also, where applicable, say how they have applied their learning.

Figure 6. The ‘generic’ ePortfolio with customised title, tabs, graphics and tool selection

The generic framework supports the cross-referencing of different parts of the portfolio (Figure 5.). For example a record of a workshop can be cross-referenced with one or more learning outcomes or skills. In this example the user can state how the workshop they attended was relevant to a skill and also, where applicable, say how they have applied their learning.

Piloting and implementation

Undergraduate Medicine at Newcastle

The ePortfolio was implemented in the undergraduate medical programme at the University of Newcastle from September 2003 (Cotterill 2004b). The ‘generic’ ePortfolio was integrated into the bespoke virtual learning environment (VLE) for medicine at Newcastle. Generic tools (CV, learning diary, meetings with tutors, learning outcomes log, action planning and SWOT) were selected and some context-specific tools were also developed.
In 2003, students in years 1&2 (n=450) used the generic tools within the ePortfolio. This was non-compulsory; students were given the option of completing sections of a portfolio either in a paper log-book or in the ePortfolio. In year 4 (n=202) it was mandatory for students to complete the ePortfolio for one of their three student-selected components (SSCs) which ran from January to June 2004. A structured ‘Learning Outcomes and Action Plan’ was specifically designed to support the SSCs. Students were required to identify intended learning outcomes (in negotiation with their supervisors). For each outcome students stated how these would be achieved and how their attainment would be measured/quantified. During the SSC students reflected against these outcomes and evidenced their achievements. At the end of the SSC both intended and unintended learning outcomes were reviewed.

A new VLE for Medicine at Newcastle was launched in September 2004. The ePortfolio was integrated in this (Figure 7) and is available to students in all 5 years of the programme.

**Contract Research Staff**

The ‘generic’ ePortfolio has also been configured to support Contract Research Staff (CRS) in the Faculty of Medical Sciences at Newcastle University (see Figure 5.) This has been tested by volunteers in a small-scale feasibility study (Cotterill 2004c). The ePortfolio has been designed to increase recognition and promote the development of generic research and other transferable skills, which are particularly important in the CRS context. In this case it was configured to incorporate the skills set developed in the Research Career Builder (http://www.shef.ac.uk/~gmpcrs/rcb.html). It also aims to provide a facility for CRS to record and reflect on their achievements on an on-going basis to promote pro-active personal development and career planning.

**Undergraduate and Postgraduate Dentistry**

A collaborative project is using the ePortfolio framework and developing context-specific tools for dentistry. This project involves 5 dental schools and 2 postgraduate Deaneries in the UK. The portfolio is began piloting in September 2004. It is being piloted with undergraduates at Queen Mary’s School of Medicine and Dentistry in London and with postgraduate vocational trainees in the Northern Deanery (Figure 8). The aim is to develop a flexible portfolio which will cross the undergraduate-postgraduate divide in dentistry.
St Andrews University

The ‘generic’ ePortfolio has also been adapted for undergraduate bio-science at Newcastle University with the aim of supporting PDP and promoting awareness of transferable skills and common learning outcomes across a number of modular programmes (Figure 10). Piloting is planned to begin later in 2004.
Preliminary evaluation findings (summary)

Three evaluation studies have been undertaken (2 in medicine, 1 with CRS) and there is ongoing evaluation of the ePortfolio in medicine and in the other contexts during 2004/5.

Undergraduate medicine

Year 1 Evaluation

Ethical approval was granted for a study to evaluate student perceptions of the paper log book and ePortfolio used by students in years 1&2. The portfolio was not mandatory in 2003/4 and students had the choice of using electronic or paper versions. Two focus groups, involving 12 year 1 students, were facilitated by a 4th year student as part of their SSC in medical education. Issues raised in the focus groups were used to inform the design of a questionnaire for the wider year group.

The ePortfolio proved to be acceptable, navigable and easy to use, though some students wanted a more ‘quirky’ / ‘fun’ design. Most students thought that the ePortfolio was ‘a good idea’ but there was a need for better clarity of purpose (ie. a training issue) and some questioned the motivation to use it when it was not assessed. There was positive feedback on the facility to browse the Learning Outcomes of the curriculum. The structured learning diary was perceived as useful at first but less so over time.

Year 4 SSC

Year 4 students were required to complete the ePortfolio for one of their three SSCs running from January to June 2004. A questionnaire-based evaluation study was granted ethical approval and students provided written informed consent to participate prior to commencing their SSC. Participants were asked to complete 2 questionnaires. These were designed to assess potential changes in awareness of learning outcomes, factors influencing use of the ePortfolio, attitudes and perceptions of educational impact, and usability.

186 students completed the ePortfolio (100% compliance) and 105 students had completed the questionnaires by 30/06/2004. The ePortfolio proved to be feasible, acceptable and facilitated the evidencing of learning outcomes. Most respondents perceived it as being beneficial (80% thought it was a useful learning experience). It had a positive impact on planning and organisation of learning:

“It encouraged me to really give thought to what I wanted to achieve during the option, which was especially useful as this was my first option. As a result of the portfolio I think I got much more out of the option than I would have otherwise.”
The quantitative and qualitative data suggests that the ePortfolio had an impact on the way some students approached their SSCs and the process prompted reflection in some students (72% spent time considering what they had learned from their SSC). Barriers to using the ePortfolio were access to computers (students predominantly used computers on-location at their SSC, at home, and/or at the University) and limited time.

Contract Research Staff

There was a small scale feasibility study of using the ePortfolio for CRS. Eleven volunteers were involved in piloting after receiving written instructions on using the portfolio. The volunteers were able to use the CRS ePortfolio to record skills, courses, presentations, and other CV information. Users were asked to cross-reference one or more workshop records with specific skills (see Figure 5), 9/11 found this straightforward. All gave positive feedback on usability / navigability:

“The beauty of this tool is that, being web-based, it is easily accessible. Once familiar with the sections within the tool I found it easy to use and simple to navigate.”

Overall the ePortfolio was found to be acceptable, navigable and easy to use. There were some suggestions for specific parts of the portfolio and it is planned to link in data from other systems to avoid possible duplication (from the University publications database for example).

Integration with VLEs

Another aim of the FDTL-4 project is to explore the integration of ePortfolios with VLEs. As well as being capable of running on a ‘stand-alone’ basis the ePortfolio has also been fully embedded in the VLE for Medicine at Newcastle (Figure 7). The ePortfolio draws on student/staff data from central management information systems (MIS). Authentication was via a Zope product (acl users folder) and more recently via LDAP. The ‘generic’ ePortfolio has also been configured to work with the Blackboard VLE either via a ‘tab’ or tool bar option (Figure 11). A separate Joint Information Systems Committee (JISC) funded project at the institution is developing ‘single-sign-on’ systems (http://iamsect.ncl.ac.uk/) which will remove the need for users to re-enter passwords to use the ePortfolio framed within Blackboard.

Figure 11. The 'generic' ePortfolio integrated with Blackboard

In September 2004 the team at Newcastle embarked on a further JISC funded project to extend the ‘generic’ portfolio and develop ‘Web services’ interface so that it can interoperate with other systems (http://www.eportfolios.ac.uk/ePET/).
Discussion

The ‘generic’ ePortfolio framework has been designed to be highly configurable in recognition of diverse and changing requirements. It features course-level customisation for selection of component tools, learning outcomes/skills sets, nomenclature, graphics etc. The ePortfolio has been successfully applied in a range of contexts (Medicine at Newcastle, Contract Research Staff, Dentistry, Bioscience and at St Andrew’s University). The ePortfolio can be used on a ‘stand-alone’ basis but it being designed to integrate with managed learning environments (MLEs).

The 3 evaluation studies undertaken so far provide positive data on acceptability and usability. In addition, feedback from users and other stakeholders in the various implementations has fed into the iterative development of the ePortfolio.

There are also some positive results from the initial evaluation studies in relation to the educational objectives. In particular, the evaluation of student perceptions of the year 4 portfolio in Medicine did suggest an impact of PDP on the approach to learning for some students during their SSCs. The portfolio was used to evidence learning outcomes and also the evaluation suggested that the process had facilitated reflection on learning. The long-term impact of this process is unknown. The use of cross-referencing, particularly used in the CRS pilot, also indicates the potential for linking portfolio records to learning outcomes - this might be classed as a form of ‘meta-cognition’. In this context users documented how particular workshops helped develop particular skills and there is also a prompt to ask how this learning has been applied in practice. This needs further testing in a wider cohort of users.

While these preliminary findings do include some positive results there is a need for further research. In the wider literature there is limited evidence to suggest that PDP does improve learning (EPPI, 2003), but there is a need for more work here.

Figure 12. Perceived location of the ePortfolio – based on van Tartwijk, 2004

The tools developed within the ePortfolio are skewed towards PDP (Figure 12) because of national and context-specific requirements. However, there are a diverse range of ePortfolio requirements (Veugelers, 2004). The underlying ‘generic’ ePortfolio architecture could support tools developed for many other purposes while still supporting customisation, sharing, cross-referencing etc.

This paper has focussed on the technology and educational objectives. However, it is also important to remember the importance of training, support/facilitation, dedicated time and resources in the portfolio building and PDP processes.

Summary

A ‘generic’ ePortfolio framework has been developed at Newcastle University as part of a collaborative FDTL4 project (http://www.eportfolios.ac.uk). The framework has been designed to support ‘value-added’ features such as sharing and cross-referencing. It has been designed to be highly configurable so that different component tools, terminology and learning outcomes/skills sets can be customised for use in different contexts. The ePortfolio was implemented in the undergraduate medical programme at the University of Newcastle from September 2003. It has also
been trialled with Faculty contract research staff and is being applied to other contexts (including undergraduate and postgraduate dentistry and biosciences and St Andrews University). The ePortfolio can be run on a ‘stand-alone’ basis but has also been embedded in a bespoke VLE for Medicine and has been work to integrate the ePortfolio in Blackboard. Initial evaluation of the ePortfolio is positive in relation to PDP and the evidencing of learning outcomes.

References
http://eppi.ioe.ac.uk/EPPIWebContent/reel/review_groups/EPPI/LTSN/LTSN_summary.pdf
The professional ePortfolio in pre-service teacher education

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Abstract: This paper has two aims. The first is to provide a brief but complete analysis of the features of the Portfolio that make it an appropriate method of and tool for new assessment, while also mentioning some of the crucial issues and unresolved questions relevant to it. The second aim is to propose the ePortfolio as the preferred tool for pre-service expert practitioner training. The paper makes reference to research in pre-service teacher education undertaken in two Italian universities Udine and Padua (see also Rossi et al., 2004).

Keywords: constructivist socio-cultural approach, new assessment, reflection, co-self-assessment, Professional-ePortfolio, pre-service teacher education.

The portfolio and e-portfolio in a constructivist social-cultural perspective

The age we live in has witnessed an unprecedented technological revolution, and that's why it is referred to as "the information age". It is characterized by both pluralism and continuous and dynamic changes. It calls for an adaptable, thinking and autonomous kind of person, who is a self-regulated learner, capable of communicating and cooperating with others (Birenbaum 1996). The specific competences required of such a person are:

cognitive competences (problem solving; problem finding; critical thinking; searching for relevant information; efficient use of information; making informed judgments; observing and conducting investigations; creating new mental models, using operative strategies, producing conceptual and material artifacts; analyzing and presenting data communicatively, using the oral and written modes of expression, etc.);

meta-cognitive competences (self-reflection, self-monitoring, self-evaluation, etc.);

social competences (leading discussions and conversations, persuading, cooperating, working in groups, etc.);

affective dispositions (motivation, perseverance, initiative, responsibility, self-efficacy, independence, flexibility, etc.).

All these competencies can be set within the framework of a constructivist-social-cultural approach to learning and its assessment.

Theoretical framework

In a constructivist-social-cultural perspective, learning is conscious action, supported by intention (defining goal and plan), reflection (pre-, in-, post-action), and constant perception of external and internal constraints and resources, it is achievement-oriented action set in a cultural and social context (Jonassen Land 2000; Varisco 2004). Learning is never separate from thinking and reflection, it is active, constructive, dialogic, collaborative, intentional, contextual, reflective action (Jonassen 1995; Varisco 2002).

Self-direction characterizes the above notion of learning. It includes both self-determination and self-regulation. The former involves the motivational processes of goal identification and plan elaboration; the latter involves the determination to achieve one’s goal and to activate one’s (the volition). Self-regulation involves metacognitive processes as well. The internal constraints and resources involve causal attributions and self-perception too (Kuhl 2000; Pellerey 2004).
PS3 – The impact of ePortfolio on CPD

Constructivist social-cultural perspective and assessment

In the learning framework outlined above the Portfolio is considered a method of and tool for new assessment (Varisco 2004). It is the expression of a constructivist social-cultural perspective. In new assessment, learning and instruction, learning-instruction and assessment are not considered separate activities or processes, but viewed in a *holystic perspective*. In this perspective the goals of education and the development of criteria for assessment are shared with the students and don’t remain a mystery to them. The content of assessment are *adaptation patterns* or “competence”. The goal of assessment is continuous improvement.

Current international research identifies the following questions as strategic topics open to discussion: a) balancing or combining formative and summative assessment by using new assessment and the Portfolio; b) combining process assessment with product assessment; c) combining internal processes and assessment with external processes and assessment; d) combining teacher and peer assessment with self-assessment; and e) combining cognitive assessment with conative and affective assessment.

The portfolio as a method of and tool for new assessment

The Portfolio shares its features with new and constructivist assessment in that it is an alternative, performance-oriented, authentic and dynamic form of assessment:

it is *alternative* to the traditional approach to instruction and assessment, which is based on the behavioristic theory of learning and tests knowledge of decontextualized, discrete units of given subject matters. Alternative assessment has a pluralistic, complex approach to competence, and does not resort to structured tasks or tests, but rather to authentic tasks (Birenbaum 1996);

it is *performance*-based, thus focusing on the assessment of competence (Khattri, Sweet, 1996). As the goals of learning and instruction are not related to content but to competence, what is evaluated is the product as related to the process, the latter seen as a combination of continuous vs discrete kinds of performance

it is *authentic*, involving real-life or extended tasks (Darling-Hammond et al., 1995), rather than unrealistic tasks, unrelated to the student’s life experience. Real-life and extended tasks are very complex tasks, which involve high-level skills and assessment of adaptation patterns;

it is *dynamic*, in the sense that it favors the evaluation and activation of the student’s learning and competence potential (Feuerstein, 1979; Lidz, 1987; Minick, 1987), understood within a Vygotskijian perspective.

New assessment and the portfolio also have *context sensitivity* and a boundary structure (Wenger, 1998), and are more adequate than transfer as a concept for this assessment. Context also comprises social context, and *social interaction* is the energy behind personal learning, while *internal* and *external perspectives* are complementary and synergic elements of personal cognition.

The unit of analysis of the Portfolio

The unit of analysis of the Portfolio is *people in action* who use tools (e.g., observation, dialogues, assignments, documents, e-mail, forum, etc.) together with other people; the learning outcomes are produced by the learning experience itself, through continuous comparison, monitoring, re-thinking and re-action (Wittek, 2004).

The Portfolio is an internal work tool and an *artefact* for learning and assessment (ibidem), which externalizes human cognition (knowledge and skills). Reflective observation, that is reflection on action and reflection in action (Schön, 1983), and reflection in learning and reflection on learning are the focus of Portfolio processes (Bartimote, 2004).

The Portfolio, with its goals of developing awareness, autonomy and responsibility, develops personal planning and the plan itself, as everyone is an “expert” in self-experience. It is a special method of and tool for new assessment, characterized by specific goals linked to metacognitive, cognitive, conative as well as affective areas.
The areas of metacognition, causal attribution, self-perception, motivation and achievement have the greatest educational impact on learning and self-regulated learning is a specific goal as well as tool in Portfolio (Varisco, 2004).

**The portfolio as a consequential assessment tool**

The properties of new assessment and the Portfolio emphasize the inseparability of thinking and action, “head and hand” (Scribner, 1987), learning and teaching, learning-teaching and assessment; these are indivisible moments and functions of education (Dochy, 2004), integrating and balancing the assessment of learning and assessment for learning (Brandfood, 2004). The Portfolio is regarded as a tool for and method of formative, educational, consequential assessment (Wiggins, 1998; Gielen et al., 2003), which does not have to pursue the explicit goal of providing certification: it has important implications for the holistic learning-teaching process.

**Product and process** become a holistic unit of analysis in the Portfolio, which uses mixed methods (both qualitative and quantitative) whereby the data obtained and elaborated (scores or rates) are constantly compared and interpreted through storytelling, negotiation, sharing and meaning making.

**The portfolio and assessment criteria**

The Portfolio is an assessment method which uses a rubric and scoring, or rating, as tools of “work in progress” (Varisco, 2004) to describe edu-metric advances and qualitative levels of competence (Gielen et al., 2003). The standards of reference are criterial as well as personal (self-standard); however, it is necessary to go beyond the conventional distinctions between formative and summative assessment (Boud, 2004; Hickey et al., 2004; Hoesma et al., 2004).

Establishing criteria is a fundamental working tool; it is a goal of learning and of the context of learning (Tillema, Smith, 2004; Elgelsen et al., 2004; Wittek, 2004). The criteria are explicit, negotiated by teacher and students, and shared (Varisco, 2004).

**The professional ePortfolio: role and functions of the portfolio in pre-service teacher education**

The ePortfolio is a tool for multimedial, hypertextual and distant communication, comparison, negotiating and sharing; it fosters exchanges of documents and implements a network of contacts between people, thus encouraging comparison and communication with peers and clarification to oneself (Barrett, 2003).

**The ePortfolio as an in- and pre-service Professional portfolio**

The Portfolio has its roots in the artistic field, where it was first used for a professional purpose, namely improving one’s professionalism. Its electronic implementation (ePortfolio) may find an appropriate application in pre- and in-service education, particularly in pre- and in-service teaching education.

**In-service teacher education**, the ePortfolio is a strategic tool for reflecting on and sharing, in a social context, the best practices emerged in specific contexts; for instance, teachers in the same school can share practices relevant to the pupils they all teach, while teachers from different schools can share practices on common teaching problems, possibly experienced from different points of view. It can be the best tool for the reflective, teaching social practitioner (Zeichner, Liston, 1996).

In an academic context, a pre-service teacher education ePortfolio can be the link between theory (lessons) and practice (apprenticeship), a “space” of permanent reflection on practices and theories, a permanent and social laboratory in which to compare, negotiate and share observations on activities of teaching education.

**Our experiences for an ePortfolio as a Professional portfolio in pre-service teacher education**

In recent years (1999-2004), first at the University of Macerata, and then at the University of Udine in Italy, an open and flexible teacher education learning
environment has been created for future teachers both at the primary and secondary school level. From 2001 to 2004, an e-Portfolio environment has been developed in this educational environment shell at these universities, which completely interacts with it (Michelini, Rossi 2003). The University of Padua has also been collaborating with the above-mentioned universities since 2003-04 in order to develop and improve this ePortfolio environment, through shared research carried out with students of the teacher education courses at both universities. (For a description of this environment see Rossi et al. 2004 in these Proceedings).

The principal goal of the ePortfolio used in pre-service teacher education is hands-on education; that is, it should help students reflect on their actions and while they are acting, as well as on and during their learning, through constant comparison and dialogue with peers within the contexts of their own and the other universities.

Reflection is the most critical psychological process in all types of Portfolios, including the ePortfolio and the Professional ePortfolio, both pre- and in- service.

We have turned our attention to this critical process by developing two educational projects. These have the goal of activating the reflective self- and shared- processes present in every ePortfolio activity. We wanted to do so by intentionally using all the tools and methods that our electronic Portfolio makes available with asp technology, a very flexible ALPI-environment. (This environment was designed and developed by Pier Giuseppe Rossi e Giuseppe Alessandri; see Rossi et al. 2004 in these Proceedings).

We now present our reflections concerning these significant projects developed in the academic context of teacher education.

**Use of a learning environment for reflective training in E-portfolio in pre-service teacher education at the University of Padua**

The first project was carried out in undergraduate courses on Assessment and Evaluation in Secondary School teaching. This experience (offered as an academic laboratory) fostered the exchange and discussion of different viewpoints within the same university context (Course of Assessment and Evaluation at the University of Padua).

54 students (7 males and 47 females), registered for the laboratory, 40 of whom (85%; i.e., 2 males and 45 females), fully participated in its activities.

The laboratory was held from April to June 2004.

There was an average of 39 connections per student.

The goal of the laboratory was a reflection on the emerging professionalism of students as educators or teachers in educational sciences, through rethinking their own motivation to their academic commitment and their own expectations about formal academic curricula and courses, and through self- and shared- reflections about their shared, real academic experiences and other informal experiences.

The formal academic professional profile of an educator and teacher was reappraised by looking at the student's own study curriculum and the actual academic education offered in the form of lessons, references, seminars, laboratories, conferences, work experience etc.

The laboratory activities were circular, divided into five steps.

The first step was self-presentation (as a student of course) in a forum. Each student had to write about themselves, their initial motivation and expectations concerning their academic curriculum and about their own academic education in their own electronic mailbox, and to read the other presentations.

During the second step, each student had to write about three topics, read or listen to three sentences and three academic or informal individual experiences, which were all very relevant for him/her, on a shared web page (Bacheca).

During the third step the students had to compare, negotiate, choose and share three topics, sentences and experiences, relevant to them all, working in a web forum of small groups (of 5-6 students per group) with a web blackboard. During the fourth
stage the groups combined into three large groups, each consisting of three small
groups, re-comparing, re-negotiating, re-choosing re-sharing three topics,
sentences and experiences, relevant to all of them in each large group. In these two
steps each student was able to express and to understand their own, as well as the
others' topics, sentences and experiences, enlarging their own horizons and
enriching their own standpoints as well as comparing these with others.

During the fifth step, going back to the beginning, each student revised his/her own
initial formal professional profile, his/her own motivations and expectations about the
academic curriculum, and re-outlined his/her professional profile.

The professional identity of the single students emerged from the group identity, the
group identity emerged from the identity of each student in the groups. Each person
receives identity from and gives identity to the other people in each community of
practice (Wenger 1998).

The process guiding this journey is a continuous criss-crossing of life’s landscape, a
continuous criss-crossing of the self’s landscape (Wittgenstein 1953).

Here is some revealing feedback from two students:

I began (this laboratory) not knowing exactly what I could write in
the first stage of work, then after some thought, and thanks as well
to the contributions of the others, the ideas started to take shape.
Ideas which I now see are common to many of us at this stage
(steps in group activities). It has definitely created a positive
impression on me, because I see that I am not alone in my
thoughts, and I am on the right way to understanding my studies,
my educational path, the profession. I think, by opening a forum
which would otherwise not be very accessible, this activity is
enabling me to find the underlying theme of what I am studying, a
theme which I was struggling to pinpoint. (Claudia A.)

And also:

At the beginning of the laboratory I had written that I was very
worried about my future profession given the uncertainties which
reign in this course relating to the future of educators like us. But
comparing myself to you has done me good in several ways, but in
one particularly: I don’t feel that I am alone on the way, let me
explain myself better… I know that probably at the end of this
laboratory we won’t even know who we are but I think that having
talked to you has been useful for reflecting a lot on myself as a
person who is participating in this degree course however full of
doubts. I am sure that as future educators it is important to stop
every now and again and think a little, not to be always caught up
in the frenzy of exams and courses, but to understand what of
significance we can take home for ourselves at a given moment,
because we have a great service to carry on with in life. (Eleonora
B.)

Use of an environment for reflective training in E-portfolio in pre-service
teacher education at two Italian universities: Udine and Padua.

The second project was carried out in undergraduate courses in Education
Technology for primary school teachers.

The students of two Italian Universities (Udine and Padua) interacted among
themselves in a shared electronic context (see Rossi et al. 2004 in these
Proceedings). This experience (in the form from of an academic laboratory) has
fostered an exchange between students’ experiences in different contexts (in courses
of Educational Technology at the University of Padua and at the University of Udine).

125 students registered for the laboratory (125 females); 105 (85%) participated fully
in the laboratory.

The laboratory was held from March to May 2004.
PS3 – The impact of ePortfolio on CPD

There was an average of 43 connections per student.

The goal of this laboratory was a comparison between the teacher education curricula of the two Universities, to develop the students' awareness of their academic curriculum, to reflect on the consistencies, weaknesses and strengths of their own curriculum of studies, relating to the professional profile emerging.

This experimental project (see Rossi et al. 2004 in these Proceedings) used many tools (web forum, blackboard, web page (Bacheca)) and methods (self presentation, dialogues, comparison, negotiation, sharing etc.) to analyse and evaluate each individual's own academic educational reality, and the development of their emerging professional profile, through discussion in large and small mixed groups (groups of Padua and Udine University students), and through discussion with the individual universities and the individual students.

The laboratory activities were circular divided into five steps.

The first step was self-presentation (as student and person) in a public forum.

During the second step each student had to ask his/her distant fellow-students questions about their academic course organization, methodology and professional development in a shared electronic web page (Bacheca).

During the third step the students, divided into a large mixed group (25 students per group), replied to their distant fellow-students in a web-forum and started to debate with them.

During the fourth step the groups were divided into small groups (6 students per group) and each group made a report using a web forum, concept maps, blackboard, making a synthesis of the weaknesses and strengths of their own curriculum of studies, relating to their emerging professional profile as a teacher.

During the last step each student elaborated a report of self work with links to made discussions about emerging professional profile.

In this laboratory the strategic tools were the questions which the students of the two Universities asked each other: these questions were a tool to move away from the centrality of self as well as to express their own viewpoint (and self reality) to others, enabling them to get to know the others and for the others to get to know them in return.

The development of the student's professional profile finds its roots in the comparison between the student and their communities of practice, close and distant communities (constellations of practices) (Wenger 1998).

Discussion

The common and specific property of our two experiments is the discovery, development and improvement of one's own professional identity through dialogue with others in a same (Padua) or shared (Padua and Udine) community of practice: this is the characteristic of Professional Portfolios and e-portfolios.

The flexibility but also the reasonable establishment of times of action in the use of ePortfolio and its tools are the crucial elements which can be difficult for users. In fact in our first experiment students had not had previous experience with the establishment of laboratory times and the web tools of a-synchronic communication, unlike the students in the second experiment. The laboratories required connection every 2/3 days, and the forum time was not more than 20 days. The flexibility but also the establishment of times of action are possible reasons for the smaller average number of connections (39 v 43) of students in the first experiment.

The electronic Portfolio, through a-synchronic communication and power web tools (web page -Bacheca-, blackboard, web forum etc.) fosters documentation, narration and self narration, discussion, comparison, negotiation and sharing.

ePortfolio and its tools provide crucial support for documenting and reflecting on self practices, for scaffolding a holistic view of practice and theory, hand and head, action and thinking, thinking as a continuous reflection about pre-, in- and after-action.
The ePortfolio and its tools set complex processes in action which ask for complex, mixed methods of assessment (qualitative and quantitative methods). The ePortfolio is both a complex method and tool for assessing the processes of continuous improvement.

The type of activities or tasks suggested in the two experiments (authentic activities or tasks) can motivate students: in fact the percentage of withdrawals is the same and is very low. 15%!

**Conclusion**

The ePortfolio and its tools can be defined as environments where students can reflect on their own emerging, dynamic professional profiles (Varisco, 2004) and their abilities as students and future teachers, i.e. environments where students can become expert reflective practitioner students and future expert reflective practitioner teachers.

For each student, the ePortfolio (and its tools) becomes the documentation of his/her own professional growth, and the student’s documented work shows how they perceive their entire learning and educational environment. The students’ production provides them with feedback useful for promoting their professional growth and for improving the development of curricula and training methods. The ePortfolio, therefore, can be seen as an important method of and tool for formative, educational, and consequential assessment of learning and teaching.

An evaluation of the on-going experiences of pre-service teacher education is giving positive and very promising qualitative and quantitative results in terms of work time, continuity, involvement, participation, sharing, as well as student awareness and responsibility. It makes it possible to explore the application of the ePortfolio and its tools to in-service teacher education, which will be our next research goal.

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PS3 – The impact of ePortfolio on CPD


PS4
Implementing ePortfolio in higher education
Implementing e-Portfolio as an organizational strategy

Portfolio is often regarded a private matter. The purpose of a portfolio often concentrates on the benefits obtained for an individual when e.g. using it to demonstrate and document qualifications and competences. This article focuses on the benefits and difficulties two different pedagogical organizations in Denmark have met when implementing e-portfolios as organizational strategies.

At "Seminariet in Aabenraa" – an educational institution for educating a wide variety of pedagogical BA's – e-portfolios are being used to further and facilitate the working process individually and in the group as well as presenting individual and group work to the participants. The strategy has from an organisational point of view been to create a working method and a tool for the learners. The e-portfolio basically allows the group to present work to each other, and later (if they choose to) for a larger group of students and teachers/counsellors. It is mandatory to use the e-portfolio, as this is at the core of the group work. The purpose of this strategy has been to strengthen the ability to reflect.

At "Odense Technical College" – a vocational educational institution teaching from vocational to BA level – e-portfolios are being implemented in relation to the teaching staff. The strategy from an organisational point of view has been to use e-portfolios as a way to make the different educations and educational methods more transparent for the different "users" of the educations: students, parents, employers, industry, ministry etc. This strategy is among other issues provoked by a Danish law stipulating that every educational institution should present and document its educations to its users following specific guidelines on transparency. At Odense Technical College it was decided to start this process off by offering the teachers an opportunity to present themselves and their educations in a web based e-portfolio tool. The strategy was threefold: 1. To ask the teachers to be "role models" for the students who would be next in line to create e-portfolios. 2. To use the teacher's e-portfolios of to be the cornerstone in presenting the college for the industry, ministry and international partners. 3. To use the e-portfolio as a cornerstone in a personal competence development project for the staff.

In the following sections we wish to present in greater detail how the implementing process in both cases was done and what the results have been.

E-portfolios as a pedagogical method and a form of educational thinking – implementing e-portfolio at the Institute for Social Education in Aabenraa

A pedagogical method and a form of educational thinking that focus on digital documentation and facilitating learning in (professions) bachelor educations in Denmark.

Background and context - a brief view on the social education in Denmark

Since 2002 we have been associated with the University of Southern Denmark, IPFU (Institute of Educational research and development) and Knowledge Lab on a project on e-portfolio. Both institutes have a tradition for research on e-learning and
on digital management. Our objects in the research done at the institutes mentioned, has been to examine and develop pedagogical possibilities in a digital portfolio as well as developing a digital model for the portfolio. Our educational focus has been on the bachelor educations in Denmark, particularly the bachelor degree in Social education. The focus in the research has been on the students portfolio, as their tool for learning and documentation. We have therefore been looking into the ePortfolio as the foundation for learning communities. The research is based on the work of 300 students, who are now on two different stages in their education: approximately 150 on their 3rd semester and 150 in their 2nd semester.

We will now give you a very brief view of the social education in Denmark, that we are connected to. The education takes 3 ½ years. The education is on the level of bachelor and the education directs its attention to a specific profession. The education is divided between theoretical studies and experiencing practice in different public or private institutions. The students are therefore partly at the Institute for Social Education and partly in practice in different pedagogical institutions f.x. kindergartens, institutions for physically or mentally disabled people, people with social problems, alcohol end drug abusers and so on. During the education the students are supposed to get familiar with a wide range of topics of theoretical and practical kind.

The education curriculum is based on central demands, that covers the theories, methods and practices, that are regarded as important in order take care of the groups of people mentioned above. The students are attending the education by honouring these demands and by focussing on achieving specific qualifications and competences.

Because the education partly is taking place in practice and partly at the Institute for Social Education the students are confronted with many different types of learning environments f.x. reflective learning, learning in practice as well as forms of learning like changing of attitude, cognitive learning and emotional learning. We assume, that this complexity of learning can be managed by the different rooms in the portfolio.

Objects of the research and aims in the construction of the digital portfolio

The objects of the research and the aims in making the digital portfolio model has been to support the students in learning objects, that in this case are essential for a profession concerned with other peoples well being and their development of an independent identity.

Reflection: the primary function of the portfolio is to support learning, and especially learning to reflect. Reflection is the most important tool of the social worker. Reflection helps us to observe ourselves, and raises the question, how we affect other people, and it enables us to appreciate the right solutions in caretaking.

Self-assessment: it is important for work in this field, that the students are conscious about, what they have learned and that they are able to express it.

Documentation of learning: the students have to train themselves to be systematic in evaluating and documenting, what they have achieved, as the curriculum is based on specific demands in qualifications and competences, that is required in the profession.

Coherence in the education: as the education is divided in periods of study at The Institute for Social Education and periods of work in practice in public/private institutions, it is important that the students are able to make these to types of learning coherent. Therefore we believe, that the e-portfolio enables them to create greater confidence in, how they can transfer knowledge and experience from one area of study to other areas of study.

1 "Having learned something" we define as being able to identify “before” and “after” having learned something, which means that to talk about learning is to talk about change. A Change in knowledge, a change in identity etc. Here the e-portfolio has a vital function as a way of remembering, repeating and maintaining the learning proces and the learning result.
Reduction of complexity: the profession in which the students are supposed to qualify, consists of a immense range of groups (children, youths and adults) and all the attached theories and collectively accepted methods and practices, that is a part of the professional identity of a social worker. The digital platform provides an attempt to reduce this complexity in order to give the student confidence in the fact, that they are on their way to be professionals.

Development of qualifications to use information technology: information technology will be a part of/is a part of everyday life in most institutions, which means that the students have to develop qualifications in using the technology.

The e-portfolio design

We will by the following illustration give you a visualization of the design and the ideas of the e-portfolio. The illustration shows, how the portfolio are constructed and the relations between the different rooms in the portfolio.

IT-specifications

The specifications in relation to the software solution: The system we have chosen is a Content Management System (CMS). The portfolio are built on an internet based web-application\(^1\). The users have access to the web-application as a community by an ordinary web-browser. All the functions are performed by a central webserver, which store all the data. It means, that the users are not bound to a certain computer, but are free to connect to any computer they want without installing special software.

A brief description of the different rooms in the portfolio model

The model functions as a homepage for den student, where he/she has a personal profile, where he/she presents herself to the fellow students, the teachers and the institutions in which he/she is having periods of practice. The students can also make a group profile, which automatically gives them the same workplaces, as if it was a personal portfolio. The student workplace consists of:

- Workportfolio: which is a private room. Only the student (or the group) have access to this room. This is a room for making notes/observations, asking

\(^1\)
questions, prepare what might be the beginning of a reflection etc. The
student can add guests to selected documents if wanted.

- Presentation portfolio: when the student is asked to place something in the
presentation portfolio (f.x. exercises, observations), or if the student wants to
publish something (f.x. to make a documentation on wanted skills or
knowledge), the student has to fill out a declaration. If he/she does not make
this declaration, it is not possible to publish anything.

- Declaration: In the declaration the student has to make a number of choices
regarding, how they want to communicate with others by publishing the
document, and they have to state whether and how the document has been
validated by others.

- Debate: if a group has established a portfolio, this will automatically give them
a room for debate. This is particularly important for the students, if the group
exists, while they are practising in different institutions and have no time for
an actual meeting. Then they are able to debate in the portfolio, and no one
from outside the group can look in on their debate.

- Open debate: this is a facility, which does not necessarily have anything to do
with a portfolio. This facility gives the students a possibility to debate with all
students/teachers, that has a login to the system. It's a facility, that has more
to do with the fact, that this is a digital portfolio and not a paper-portfolio.

- Database: All the presentation portfolio’s constitutes a database, that has
different layers. All internet users can make a search for the publications
placed in that part of the database, which is completely public. Another kind of
public (the people with login to the system) can make a search in all
published materials. In all cases the declaration is attached to the document,
so the searcher is able to see the choices the publisher have made and the
validation of the document.

Research on portfolio as a tool for educational thinking - the
hypotheses

The portfolio is in our way of thinking an integrated part of an education. The portfolio
offers a certain structure and a way of learning to the students, but at the same time
it demands a new form of educational thinking, a form of portfolio-didactic design.
The portfolio-didactic design has f.ex. an effect on the teachers role in the learning
process, and on the way exercises are put and assessed during the period of
education. In our case it's combined with problem based learning.

In the pedagogically thinking presented here, the learning facility of the portfolio is
based on the declaration that appears in connection with publishing various kinds of
documents. This declaration is a way of supporting the students ability to reflect on
their work and to empower them to self-assessment. If the students on the other
hand are searching/browsing for each others' documents in the database, the
learning issue is connected to the students ability to judge the quality and relevance
of the documents

The purpose of the declaration is to support the students in reflecting on, what they
put in their presentation portfolio. The declaration is the identity of the document, that
will tell writer and the recipients why, when, what, how and to whom this document is
produced. The declaration therefore offers an opportunity for the student to reflect on:
criteria for selection: purpose, relevance, make a distinction between subjective
experience and knowledge and generalized knowledge,
the importance of context, target groups, the recipients profit of reading/seeing the
material, writing in a fashion worth reading.

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¹ We use the term "documents" as if we are only dealing with written material. As of now this
is only partly true. The students can make links in the portfolio and they can import pictures.
But in a longer perspective, we hope, that the students will include pictures, videos, sound-
jpg's etc., that will present their work in a more vivid way, than just written documents.
evaluation of the quality of the document and of others peoples evaluation (f.x. a teachers evaluation, evaluation from peers, people from the field of practice etc.), selfassessment.

So the declaration is, in short terms, the reflections on the learning proces and the result of a learning proces.

Reflection as a learning space

Society today can be characterized by increased complexity and polycentricity. If you add to this a decreasing number of common values, that a generation ago determined what was regarded wrong and right, this points to the fact, that the individual has to relate to itself and its surroundings in a different way than just a few years back. This cries for ability to reflect: to reflect on oneself, to reflect on how the individual interacts with other people, and how the individual regards the interaction between itself and its surroundings.

A definition of the concept of reflection:

a. Reflection on action: This type of reflection is at a distance from the actual events, that required reflection. It is situated on an abstract level, it can be generalized, and it is possible to express the reflection. This type of reflection involves descriptions, analysis and evaluation of occurred events, decisions made etc. Therefore reflection on action gives the reflective individual an opportunity to get wiser.

We assume, that this type of reflection will take place and will be present in the work with the declaration, that pops up as a part of the publishing proces, and in the work with the material, that the students choose to place in the presentation portfolio.

The different elements in the declaration, that they have to relate to, "kickstarts" the reflection and forces them to express their reflections.

b. Reflection in action: This type of reflection is tied to the context in which an event occurred. The reflection is often very tangible and have a tendency to appear as implicit knowledge/tacit knowledge.1

We assume, that this type of reflection primarily take place in the work portfolio.

We understand the concept of reflection as an activity, that can be described as watching oneself and oneself interacting with others at a distance, reinterpreting choices, events, decisions made. The objects of reinterpretation can be theoretical as well as practical. Regardless of the type of reflection the essential ability at stake, is the ability to watch oneself: what is my perspective on the world, what are my motives, thoughts etc., because this effects my role as a professional caretaker.

Summary of results

In connection with the ending of the semester the portfolio has been internally evaluated in writing. All students have filled out a questionnaire about the experiences of using the portfolio as a tool for learning and documentation in education. The questionnaire was made by 61 % of the students involved. To support the questionnaire there was made qualitative interviews with a small group of students. The research was made in coorporation with Ph.D. student Torben Kure Marker from the University of Southern Denmark.

the students personal profile is seen as a possibility for personal expression and identity.

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1 Tacit Knowledge implies, that it is knowledge, which the individual does not know, how to express, or that it is knowledge, that the individual is not aware of/consciouss about. This type of knowledge can be embedded in your body (which connects it to Pierre Bourdies concept of “habitus”) or it can be emerging but not yet conceptualized knowledge.
the portfolio's contribution to the IT- qualification is dividing the students into two groups. One group of students see the portfolio as an easy tool. The other group of students see the portfolio making demands on IT-qualifications, which this group of students does not have. This makes them uncertain. It seems, that if the technical solutions is regarded ad difficult, it is accordingly difficult to maintain the purposes of the work with the portfolio.

- the working place in the portfolio is meaningful, but it takes time to use

the declaration of documents are regarded as relevant and useful, but some times it is difficult for the students to see the point. It is not all exercises and tasks which are meaningful to declare. The way we think about the declaration is, that it demands a rather high level of awareness on the relevance of dividing between different public contexts. These are skills which we hope the students get during time by working with the declarations. At the same time it is important for the student to work with the declarations to achieve consciousness of their ability to reflect in and on practice.

the presentation portfolio is a very good idea, it gives the students a view over their work, and makes it easier to find previous papers, tasks and exercises.

the knowledge database does not yet have a lot of documents. But the students find the idea of it to be very meaningful.

the open discussion room are not used by the students. We believe that it will demand a special effort from the teacher to make it work.

the group discussion room is used by the students

many of the students have pointed out that they want to own their portfolio as a life long learning tool. This of course we find very encouraging.

on the one hand the system is experienced as a simple tool, on the other hand the students sometimes miss some of the ordinary tool bar for working with the "Word"-software.

the simplicity of the tool is mostly a cognitive simplicity. The students would like to navigate more freely. They also want more icons to help them remember different facilities.

Lessons to be learned

Organizational reflections and the role of the teacher

The organization surrounding the work with the e-portfolio seemed to have greater importance, than we initially thought. We discovered, that student work with the e-portfolio affects the role of the teacher, it requires another didactic thinking, than the use of paper-portfolio's.

In the questionnaire we found some patterns in the students answers on the importance of the teacher as a role model:

It seems to be of great importance for the major part of the students, that the teachers:

update their pages frequently.

that they use the portfolio to communicate with the students instead of only using the intranet.

that the teachers frequently remind the students to use the portfolio in terms of giving them exercises, assignment etc., that they are told to publish.

In the qualitative interviews it seemed, that the motivation for using the e-portfolio in the beginning of the education, is clearly connected to the attitude of the teacher and to the teachers own use of the system.
The technical solution

Another pattern occurred, when looking into, in which way the students would consider the e-portfolio as a support to reflection: it seemed to be crucial, that the technical solution fits the purpose. One third of the students asked, found it complicated to consider this question, while they had difficulties in using the system.

The need for several declarations

Regarding the declaration: When we looked into the students opinion on the declaration as an idea, it was easy for them to recognize the possibilities in discussing and expressing the various elements in it. But the overall competency to comply with the demand of describing context, identify target groups and to communicate in a fashion, that was meaningful accordingly, they conceived as difficult. It might be important to stress, that the students asked are still at the beginning of the education.

Our conclusion to this point is, that it seems valuable to differentiate the declaration formula to match different semesters. Otherwise it might not have the effect on the ability to reflect, that we could have hoped for.

How to maintain the portfolio as a support for the ability to reflect

From the questionnaires and the qualitative interviews we conclude, that if the point is to support the ability to reflect, its vital to construct a portfolio, where reflection is unavoidable. Even though (as mentioned above), the students find the declaration difficult to discuss and express themselves about, they agree on its necessity in the publishing process.

Implementing e-Portfolio at Odense Technical College

Background and context for e-portfolios at Odense Technical College and a brief view on vocational academic education in Denmark

At Odense Technical College, we have been working with e-Portfolios as a means for pedagogical development since 2001. At that time we developed and implemented a project in collaboration with The Centre for Development of Human Resources and Quality Management (SCKK), a centre funded by the Danish ministry of education. The purpose of this project was to offer the e-portfolio as the space for developing the competences of the staff (management, teachers and others) at the college – in other words to make an e-portfolio based human resource management system. This project had the purpose of allowing the personal wishes for educational and personal development of each teacher, manager or other staff to be understood and related to the general plan for developing the college as a whole. In relation to e-portfolios the idea was to use a web based tool to present and document individual competences as well as descriptions of plans for development for the college as a whole.

The focus on the development of competences for teachers at the Danish vocational colleges was massive in the beginning of 2001, because a law had just been passed for the creation of "Vocational Academic Educations". The educations taught here are of two kinds: bachelor level and "Short circle non-university higher education". The latter give the students a diploma level (120 ECTS) – which they can use as credit transfer to finish their bachelor levels at The University of Southern Denmark and Aalborg University.

The "new" educations were to some extent based on educations known in Denmark as "Technicians-educations" although some were brand new. The point is that quite a lot of the teachers in the "new" educations were also employed at the old ones. And they did not all have the Master level required for teaching at an institution of higher education. The focus on the development of teacher competences was therefore at the heart of the HRD department of the new Vocational Academic institutions.
The vocational educations in Denmark have also in recent years been met with a growing demand for visibility and documentation of the work they do. The vocational system in Denmark is based on a close collaboration between the college and the industry. This emphasizes the ability of the college to communicate with its surroundings. These surroundings are not just local or even regional, but in recent years also global. Two of the vocational academic educations at OTC are now offered in English for an international audience of students. This means that the college needs to explain itself to new audiences almost every day. The so called "Bologna-declaration" (Joint Declaration of the European Ministers of Education) from 1999 suggest that the educations offered within the EU needs to be "comparable" and "mobility promoting" to be competitive. The e-portfolio offers a way to show the visions and values of the educations as well as the reflections on the goals and content of each subject as described by each teacher. This is a less formal way to develop comparability than the simple ECTS credit points.

**What has been the role and purpose of the implementation of ePortfolio among staff at Odense Technical College?**

As mentioned above we started the process of implementing e-portfolios among the teaching staff. The hypothesis was, that if the teachers themselves started using the e-portfolio as a means of presenting their reflections on the subjects they teach as well as documenting their competences for the students, they would become role models and examples for the students – who would be next to start their own e-portfolios. In a world where documentation and reflections on your own learning process is getting more and more important, the focus is on learning skills – reflecting and documenting your own learning process.

The incentive for the teachers was that the e-portfolio gave them a chance to demonstrate and document competences that they have gained through their working experiences, some of which had not been formerly recognised. This would for some of them mean they would be on the road to achieving the academic level, which is formally required for teaching at the level, they are actually teaching now.

In this sense the implementing of e-portfolios has also been a part of the colleges program for appraising and documenting the non-formal competences and skills of the teachers.

Another general strategy of the college has been to make the college and every teacher more accessible for the local, regional and national industry as well as the international partner when collaborating in projects across borders and sectors. The e-portfolio presents a way of "showing off" a lot of the work we have already done in various fields as well as presenting the members of the teaching staff – so that partners will know who to contact and what experience to refer to.

Last but not least the strategy of implementing e-portfolios has been to help the development of the college as a "knowledge" centre for the region within the different subjects that are taught at the college. The Danish ministry of education wants every college to function in this way as a knowledge "broker" for the local and regional community – that is not only offering courses and educations but also participation in local networks, offering counselling etc.

Therefore the ePortfolio strategy at OTC has been to present educational competences, core professional competences, development plans and teaching materials through the reflections of the teachers. The scope of the implementation of the e-portfolio is 60 teachers in 5 different educations.

**Objectives of working with the portfolio**

The implementation of e-portfolios among the teaching staff at Odense Technical College was part of a "competence development project" – a project for the development of teacher's competences in accordance with the strategies for organisational development on the college.

- The ePortfolio partake in supporting learning processes for the individual teacher
The ePortfolio is to a large extent a way of making the often "invisible" and "numb" work of a teacher visible and readable both for the reader and for the teacher him- or herself.

The ePortfolio has the point of giving the students access to information about the teacher and his or her experience and formal qualifications.

The e-Portfolio has the purpose of presenting the teacher as a "player" in relation to international projects.

The e-portfolio aims to be a frame for offering services for the local and regional community in relation to being "a knowledge centre".

The purpose is also to enhance the skills of the teacher's in relation to using ICT (in this case a web based content management system).

The e-portfolio design

This is a model of the e-portfolio design (e.g. http://www.multimediedesigner.ots.dk/users/LiseAgerbaek).

The e-Portfolio is web based and is updated individually by each teacher (and student) by using an open source (ZOPE/PLONE) content management system accessed via a browser:

- **Presentation** is the "home page" for each teacher. Here he or she can tell about what they teach, and what they in general think of their subjects. This part must contain an image and the teacher can choose from a variety of personal data to publish.

- **Materials** are a space to publish teaching materials (self written or produced) for students and other interested parties. This is not the space to place materials used in everyday teaching. The college already has several Learning Management Systems (LMS) for this e.g. Blackboard, Fronter and a dedicated one called "Studieplan". **Materials** is a space for "publishing" your work in your Portfolio.

- **Learning Style** is a questionnaire based visual presentation of the teachers learning style. The teacher answers the questionnaire and based on this a visual presentation in the shape of a "system of coordinates" is created. The Danish Institute for Educational Training of Vocational Teachers developed the questionnaire based on the theories of D.A.Kolb (1984) and R. Smeck (1988).

- **Radar analysis** is a visual presentation of self and peer assessment in relation to a set of profiles. These profiles express the values and competences in the education where the teacher works. The radar analysis is also based on a questionnaire that the teacher him- or she can write. She can subsequently answer the questionnaire.
herself and publish it to her manager, colleagues, external partners etc. The visual
presentation has the shape of a "spider web". The radar analysis is a quick visual
way to express the gap between where you are, and where you strive to go. The idea
is, that this radar analysis is revaluated at least once a year. The development of the
radar analysis is described in a "working paper" (Agger, Hansen and Oksbjerg
2002).

**Forum** is an individual forum attach to each individual e-Portfolio. Here students,
colleagues and management can comment on and discuss what he or she reads in
the e-Portfolio. The teacher can also use the Forum as a Log – explaining e.g. the
progress of his or her competence development.

**Portfolio** is the part of the e-portfolio that contain the reflections on the actual
knowledge, skills and competences of the individual teacher. The Portfolio is divided
into two parts: profiles and competences. The teacher chooses an unlimited number
of profiles, describing the different “jobs” or “roles” he or she has had, has or wants
to have. The profiles could e.g. be curriculum developer, teacher, manager etc. The
teacher describes each profile. To the profile a number of competences can be
attached. The competence is the description of a particular skill, or "piece" of
experience, that the teacher finds it is necessary to have to "perform" the profile.
Sometimes a competence is the "building block" of more than one profile. A
competence cannot be published by itself – it has to be attached to a profile.

It is possible within the e-portfolio backend (the CMS) to make the publication of
different parts of the site limited to a certain period. Also you can decide not to
publish parts of the portfolio. There are no requirements for every teacher to use all
of the components of the e-portfolio. This is entirely voluntary.

**Research on Portfolio as a tool for teacher's reflection on own
learning and development**

The following research results are based on qualitative interviews with teachers who
have developed an e-portfolio in relation to the competence development project
described above. Also a lengthy interview was done with a consultant, who has the
part of "competence coach" during the process. Lastly an interview with a HRD
manager at the college form the bases of the research data together with the
materials and texts collected from the different e-portfolios.

The competence development project consists of a series of seminars performed by
The Danish Institute for Educational Training of Vocational Teachers. The purpose of
the seminars was not as much to give concrete skills as start off the process of each
teacher reflecting upon his or her own competences and profiles. This process of
reflecting was done as on the job training while "filling in" the e-portfolio. Every
Tuesday the "coach" offered his help "filling in" the e-Portfolio. The coach was there
as a facilitator and discussion partner for the individual teacher. 10 teachers chose to
use the help of the coach.

The design of the e-portfolio has the purpose of actually forcing reflection upon the
teacher. The teacher has been used to seeing his or her "qualifications" in terms of
"formal" qualifications – that is the kind for which you have a diploma or some other
kind of paper. These "formal" qualifications put together add up to a "curriculum
vitae", which is a fixed and widely used way of presenting what you know and can
do.

In the e-Portfolio this "normal" way of presenting yourself is broken and disintegrated
into parts. The intention is that the teacher is forced to reflect upon own competences
and skills – on the profiles or roles he or she plays for the students – and what
competences made it possible for him or her to fill out this profile.

Also documentation plays a very important part of the e-portfolio. The teachers are
asked to document their competences hence they have to reflect on new forms of
documentation that follows the kind of competences they feel they have. The need
for documentation is growing in more and more areas of modern lives as the "formal"
qualifications become "old fashioned" almost before you finish the course. So there is
a great need for a new ways of documenting progression in skills and personal
development. The e-portfolio emphasizes this aspect by making it necessary for the teacher to formulate his or her own documentation. The teacher "accidentally" in this process require a competence for finding/formulating documentation which is a vital skill when partaking in the external networks of the college – hence partaking in making the college a "knowledge" centre for the region.

Summary of research results

Based on the interviews with teachers, consultants and managers different issues have been raised in relation to the on-going implementing of the e-portfolio among the teaching staff at Odense Technical College

The process of actually presenting yourself as a person to the students is for some teachers experienced as a loss of authority especially if the students have access to documentation as e.g. Exam papers etc

Some teachers on the other hand felt that it in fact benefited the student/teacher relationship because the students know you more as a person than an authority figure

The process of actually presenting yourself as a person to regional industry or international partners was only done in a few cases – for example only a few teachers made their portfolio in English

It is for many teachers an enormous hurdle to write about themselves hindered by both a personal shyness and a feeling of "not wanting to show off"

It is felt that it is difficult to write about competences because the concept had not been defined well enough in the process

It is felt that it is difficult to document competences because what constituted documentation had not been defined well enough in the process

It is felt that a great benefit to be forced to "get it clear in the head" on what it is you can as a teacher – because these are competences that generally are gained through experience rather than formal education. So describing your competences and profiles make you more aware of how skilled you are

The teachers feel that the e-portfolio and the process of describing own competences actually helps develop a feeling of where you are as a teacher, and where you want to go. (You get a feeling of where you are missing something and what you want to do about it).

Teachers who have some experience in writing in a "journalistic" fashion use the e-portfolio more frequently. Teachers with no such experience have great difficulties in writing more than a few lines. The e-portfolio also is used more in relation to educations where communication is part of the curriculum.

The "coach" was a very important person in getting the job done. A major part of the teachers point to the fact that they wouldn't have gotten through the process without the coach to talk to.

Also it was essential for the teachers that the filling out of the e-Portfolio is part of a funded project so they were paid for their time. It is a lot of work and cannot be expected to be done as part of the normal workload

Some teachers tend to regard the e-portfolio as a very private matter. They tend not to see themselves as representative of the college or the education towards students as well as industry, ministry or international partners. They do not draw a distinctive line between their private issues and issues relating to their personal professional life. They tend not to see the organizational benefits of the portfolio – and regard the organizational purpose with some distrust (Are they really looking at me for evaluation purposes? Will this get me fired?).

The coach pointed out that the managers have to be very clear on the purpose to kill the idea of the e-portfolio being used primarily as a manager power tool

The content management system is believed to be "difficult" even if useable
Lessons to be learned

The need for clear organizational goals and means

Establishing the necessary organizational structures for the implementation process is a longer process than anybody imagined. Interview with managers indicate that the ePortfolio has to solve actual everyday problems for both teachers and management to be more than an experiment. It is also important that the college acknowledges that this is actual hard work and should merit pay. The point of the teacher being representative of the college and an important communicator to industry, ministry, international partners as well as the students have to be more clearly expressed. The overall role of the portfolio in the relationship between the college and its collaborative partners broadly understood was not clear to the teachers. This is by many teachers considered an "add on" and not a core issue in the e-portfolio.

The defensive mechanisms against self-presentation

A teacher is often used to regarding the job profile of a teacher as something that happens only in front of students in a classroom. So when asked to document it – some feel this lies beyong the duty of a "normal" teacher. They feel challenged and "big brothered". Their defensive mechanisms are in some cases so massive, that they never get far enough with their e-portfolio to actually reflect on their teaching methods. The defensive mechanisms also seem to hinder the acknowledgement of the communicative role of the e-portfolio towards being part of a regional "knowledge centre" or an international project. The problem is that the job profile has changed in recent years without the anybody actually discussing it.

Reflecting is positive for the individual teacher when done in a "safe" environment

It seems that to be able to support reflection the structure and content of ePortfolio should make reflection unavoidable. Once the teachers got started they enjoyed the process of reflecting upon their own teachings skills and upon how to document them. But they needed to feel "safe" when doing it. This is where the coach played a very important role.

Student/teacher relationship can be changed through implementing the portfolio

It seems that the teacher/student relationship is affected by the ePortfolio in different ways – specifically the teachers seem to be less seen through a veil of prejudice, when they present themselves through ePortfolio. Interviews with students indicate that the students (who are also more IT-literate) seem at ease with getting acquainted with the teachers through the ePortfolio.

Communicative skills are essential

The general competence to meet context demands as well as the ability to identify the recipients of written documents are very important competences in making a portfolio. Some teachers had no prior experience with this kind of work, as they teach largely orally or teaching-by-doing. The coach in these cases felt that he to a large extent worked as "writer" for the teachers. Supportive courses in writing and communication seem like a good idea.

ICT-training in the CMS is a good idea

It seems that it is crucial to whether or not the ePortfolio actually support learning processes, how well the technical solution fits the purpose. You have to have a pretty extensive knowledge of IT to use the platform, it is indicated through interviews with teachers. Coaching, courses or other forms of training is a good idea so technical difficulties do not in themselves hinder the use of the e-portfolio.

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PS4 - Implementing ePortfolio in higher education
The Challenge to the Manager: one toolkit, three scenarios and change management can start ePortfolio implementation

(full paper will be available online)

The Challenge to the Manager: With One Toolkit, Three Scenarios and the Change Management Can Start the Portfolio Implementation!

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Background

At the moment, the entire Dutch higher education system is devoting more attention to competence-oriented learning and skill development. The use of an e-portfolio makes an important contribution in this context. There is more and more recognition every day of the opportunities using the e-portfolio can provide. Examples of good practice have already been described in the Netherlands, especially in the occupationally oriented curricula such as Teaching, Medicine and Small Business. The challenge now facing the Dutch higher education system is to expand portfolio use over entire institutions and consortiums of institutions. The next step will surely be to link the use of the portfolio in the education column so that the e-portfolio can support life-long learning.

On the initiative of SURF and ALT, an expert meeting held in April 2004 was attended by portfolio experts from the Netherlands and the United Kingdom. It became clear at this meeting that pilots are being widely conducted in the Netherlands and knowledge is being compiled that can be extremely useful to other European countries. We would like to take an initial step in that direction in this paper.

There is a tradition in the Netherlands of various institutions working together and widely distributing the results. This was the case first with the SURF E-folio project in September 2001 - September 2003. The final result was a handbook in print and web-based with descriptions of a number of portfolio applications in the Netherlands. SURF had opened a website earlier with a discussion forum: http://www.edusite.nl/portfolio.

As in other European countries, there was a great need for an exchange of experiences and material, certainly when the first portfolio tools became available. In 2002 the Digital University (DU), a consortium of ten universities, introduced a Portfolio tool that could be used by various educational institutions and commercial firms in the Netherlands. In response to it, a project was launched in 2003 for the further support of the comprehensive application of an e-portfolio at an institution.

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1 The ALT-SURF Spring Conference and Research Seminar: Living & Learning: ePortfolios and Digital Repositories was held on April 22 - 23 2004. ALT (Association for Learning Technology) is the leading UK body bringing together practitioners, researchers, and policy makers in learning technology. SURF is the higher education and research partnership organization for network services and information and communications technology (ICT). The aim of the meeting was to combine the knowledge and experience of the two countries and create the basis for cooperation in the future. As a result of this expert meeting, a briefing paper is to appear in the autumn of 2004.

2 E-folios (electronic portfolios) are popular in the higher education sector, but are difficult to use. This project provides guidance based on experience on exploiting their potential and avoiding the pitfalls. Particular attention is devoted to life-long learning, monitoring and supervising the development of competences and skills throughout the curriculum, the assessment of competences and skills, ICT for e-folios and the implementation of educational innovation. There is collaboration between the Universiteit Maastricht, the University of Professional Education Utrecht and Utrecht University.

3 Jan van Tartwijk and Erik Driessen reported on it at the ePortfolio conference in October 2003 in Poitiers.

4 The Digital University is a consortium of ten universities in the Netherlands. It focuses on the development and application of digital educational products and knowledge in higher education.
This project expanded on the experiences of the SURF E-folio project. In the paper, we describe how this took shape. The summary is included below.

Objectives

The point of departure for the DU project was to make the example material of portfolio applications already in use at the participating institutions available with a low threshold. The target group that was focused on included teachers acting as counsellors and developers as well as managers and project leaders involved in the implementation routes. The example material for the managers and the project leaders would mainly have to be supportive in shaping the aims for the portfolio applications and the relations between the applications and the instruments to be made accessible.

To get a clear picture of the material that would mainly be called for, a need study was conducted under counsellors / developers and managers. The material would be put on a website and was to be easily accessible. There would also be a clear link on the site to the SURF E-folio site and the site would elaborate upon it.

Summary of results

The need study demonstrated that there was mainly interest in:

- A portfolio instrument indicator: a connection between portfolio applications and relevant examples of instruments
- Examples of complete manuals, separate instruments and example portfolios.

Website portfolio implementation

The project resulted in a website http://www.du.nl/portfolioimplementatie with the following structure:

- manager’s section
- example instructions for students and teachers
- examples for each item or instrument
- example portfolios.

The material can be rapidly comprehended. Scrolling is virtually unnecessary; users just have to click onto the screens and files. Choosing from the wide range of available material made the website more convenient to use.

Three portfolio application scenarios for managers

Instructions are given in the manager’s section for managers or project leaders dealing with portfolio implementation routes. An important part of the instructions is the division into three portfolio application categories: three portfolio scenarios. This generated three coherent approaches to higher education in which the portfolio can play a meaningful role. The division provides an opportunity to accord a place to good practice and indicate what good practice is relevant. The scenarios can be utilized to make the aims explicit and to use the instruments and checklists that are in keeping with the particular scenario. Since introducing the portfolio is not an isolated change but one that stands for changing the conceptual approach to education, a comprehensive implementation often comes up against aspects pertaining to change management.

The project has given instructions for a science-of-change approach to portfolio implementation for each of the three scenarios. This makes it more feasible to set priorities for management tools that are to play a central role in the e-portfolio implementation route.

The relations are briefly as follow:

Scenario 1

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1 The participating institutions are the Universiteit van Amsterdam, INHOLLAND University, Free University Amsterdam, Saxion University, the University of Twente, the University of Professional Education Amsterdam and the University of Professional Education Utrecht.
Portfolio application is focused on counselling (personal development and making choices) and is not integrated into all the educational activities. Not all the teachers have a counselling assignment. Implementation can be carried out for each individual project.

Scenario 2

Portfolio is focused on supervising and evaluating. Portfolio is integrated into all the educational activities. All the teachers have supervisory and evaluating assignments as regards student portfolios. It is essential in the implementation that human resources management and performance and competence management are effective. The switch to working with portfolios is not that easy for every teacher. The organization should give the teachers whatever support they require.

Scenario 3

Portfolio is used in demand-steered education. Students design their own educational route and organize their own tests. There is no longer any semblance of an educational curriculum. The conversion to this scenario is extremely far-reaching. In practice, successful examples of it only emerge around teachers with explicit views on this approach. For comprehensive implementations to succeed, visionary leadership, spunk and charisma are required.

Scenario model works

Various study programmes have adopted the scenario model to test their aims as regards the use of portfolios. It is surprising that study programmes sometimes opt for a development in the application of portfolios, and consequently a development in the conceptual approach to education. We might speak of opting for a dynamic concept of education. One example of opting for a dynamic concept of education is the group of five Schools of Economics at INHOLLAND University. They have pledged to start educating in Scenario 1 and then continue developing to Scenario 3.

The instructions for managers are presented as an essay of nine screens that documents are linked to. A portfolio landscape has been added with good practice from the Dutch higher education system. Checklists have been added for managers, who can use them to determine their own position as regards several views of implementation.

Example material

A great deal of material has been collected, especially for the development portfolios (Scenario 1). Examples have been put on the site of instructions for students and teachers. The appropriate segments of the instructions have also been classified separately. Example portfolios of students are also shown for each of the portfolio application scenarios.

Conclusions and recommendations

The project has succeeded in collecting portfolio material from a variety of contexts and presenting it conveniently on a site. The initial reactions indicate that the material is accessible.

It would be wise to conduct further research into the steps in the dynamic concept of education as described above. Can the steps be properly supervised and can they be explicitly circumscribed in tests?

Cooperation adds a broader context to portfolio applications. In academic education, examples can mainly be found of portfolio use for the development of academic skills. In professional higher education and occupation-oriented study programmes, a focus on competence plays an important role, with the curriculum being demand-steered to varying extents. These differing approaches to portfolio applications have enabled the project group to design a Website for an extremely wide audience. On the basis of this wide expertise and the compilation of portfolio research, the next step in educational innovation can be taken with the e-portfolio in the Netherlands as well as abroad.

A number of project members attended the SURF-ALT expert meeting and gave presentations at the SURF ALT Conference, Online Educa Berlin 2003 and EUNIS.
2004. The compilation of expertise in the Netherlands expanded at the Special Interest Group NL-Portfolio recently founded by SURF, a group of portfolio experts who are going to incorporate their expertise and see to its further development and cooperation in the Netherlands as well as abroad.

In the paper we describe in greater detail how the electronic portfolio is implemented in higher education in the Netherlands and more specifically at the Universiteit van Amsterdam and the INHOLLAND University.

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Website DU project Portfolio Implementation: [http://www.du.nl/portfolioimplementatie](http://www.du.nl/portfolioimplementatie)
Evaluating ePortfolio use in Higher education

E-portfolio for teachers initial training

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Abstract: In teachers’ initial training, the projectual skill and the teaching ability acquisition require a theory-practise circularity and a reflection before, during and after actions. The e-portfolio can support those processes. The Education Faculty e-portfolio is structured into 5 sections (selection, connection, narration, direction, and orientation) and it is technologically supported by a structure for networked documents: texts with links, outlines, and maps.

The final evaluation pointed out a greater awareness of projectual skills and personal professionality, a change of students’ study method and it allowed an accurate evaluation during the exams.

Introduction

In teachers initial training, the implicitness presence (Michelini, 2003a; Rossi, 2003b) and the overcoming of didactic projects mechanicistic methods (Pellerey, 1998) require methods and tools allowing the reflective professional (Schön, 1983) to rebuild and reflect on his past experiences according to learnt theories (Varisco, 2004). Moreover, the projectual skills acquisition (to know how to plan courses, how to manage, evaluate, change them according to the evaluations’ feedback) requires the ability to manage complex projects often involving the subject himself, his history, his behaviour. It is essential to re-build the meaning of past work experiences by narration (Bruner, 1990; Gergen, 2001), re-crossing theorical-practical paths (Wittgenstein, 1953), looking at learning as a “dialogue with uncertainty”, self-awareness and relations ability to build the real world (Morin, 1999).

All that is just a utopia, if we do not select tools shaping circular connections between theory and practice, between event and context, practice and its analysis. Undoubtedly, the e-portfolio can support this aim.

In teachers’ initial training, the paper e-portfolio has been often used and described and the reasons can be shortly listed in the following way:

The first is the professional portfolio is widely recognised as a tool for self-evaluation and self-reflection, resulting in the improvement of capturing opportunities for learning. The second is the self-reflective process initiated by the portfolio sets the stage for a career of continuing professional development. The third is the constructive process of assembling a portfolio can enhance collegial discussion. Finally, for those in the profession already, the development of a portfolio results in the improvement of instruction and a pre-service teacher portfolio used when seeking employment can improve your likelihood of being hired. (Takoma, 2002, p. 57)

The initial training portfolio is connected with the teacher portfolio used at the moment by more than 1000 institutions to train and evaluate teachers in service in
English speaking countries being them in Europe, North America, Australia (Seldin, 1997).

The e-portfolio represents a quality improvement of the paper portfolio. For e-portfolio, we mean selective and purposeful collections of student work (or theoretic fragments selected by students) made available on the WWW. The technology use does not only change the support recording the materials, but effects the structure itself of the portfolio. The main difference is the chance to build networked links and create notes out of indexes, maps and summaries of selected documents in a sort of "synaptic way".

For the pre-service teacher education, the e-portfolio has been tested in different ways. Among them, the University of Western Sydney, Australia tested how 9 students used the e-portfolio instead of the paper one during three semesters (Woodward, 2004); the researches made by north American universities as Ball State University (Britten & Mullen, 2003), the University of Nevada and Las Vegas (Mc Kinney, 1998). Two different approaches can be seen in the researches made by the Education Faculties of Amsterdam and University of Ottawa (Walker, 2002). University of Edinburgh made very interesting researches as well.

**Background and research hypothesis**

During 2001-2002 academic year a research studied implicit knowledge about teaching profession (Michelini, 2003a; Rossi, 2003b). The research analysed students' notes in a forum and it compared them with didactical project. A great difference came out between the forum explicit theoretical knowledge- where constructionism was always mentioned- and the planned activities-where transmissive simplified proposals prevailed in order to "match with" children. Moreover, a forum thread asked the students to state explicitly the event that marked their school courses (from 3 to 18 years old). As a result, it was evident a teacher's model coming from their experiences at school.

The main critic elements were the following:

Theorical referral to **constructivism VS deeply transmissive practical methods**;

Theorical referral to a **children-centred model VS** projects of activities, where children has just to listen and fill printed forms;

Theorical referral to **children potential VS statement**, often indirect, where children potential in learning is under evaluated, mediators are used to simplify and the language is rich in diminutive.

In order to overcome the above mentioned difficulties -verified also by other Italian universities- two proposals were suggested and planned with Bianca Maria Varisco of Padua University:

A laboratoty to realize a discussion (like professional e-portfolio), where the students are requested to think back to the reasons of that Faculty enrolment, their initial and following expectations. It has three main steps, that are forum debate, group sum up, and individual reflection. It has been used at Padua University Education Faculty (Varisco)

A web negotiation lab. involving students of two Italian universities (Padua and Udine), to analyse if and how the same course changed into the two universities to improve students' educational design skills.

These activities helped to improve the students' self-evaluation and reflection skills.

To this aim, the main activity was the **e-portfolio**. The e-portfolio has been tested to see how university students build and improve their projectual skills (educational design) linking theory, labs, students' debates and mainly their apprenticeship.

According to initial hypothesis, the e-portfolio would allow:

to improve the teachers skills, have more explicit models and knowledge;
to support a continuous circuitry between theory and practice, expert models and students conceptions; to increase the students’ awareness of the way they plan the didactics;

to change and personalise the University students' study method;

The reference models

The e-portfolio project mainly followed two models: the one of Danielson and Abruthyn (1997), used also by H. Barret (2002), and the one by Takona (2002) projected as a paper portfolio for pre-service teachers

Takona develops a Portfolio Development Circle (PDC) in 4 stages (Erreur ! Source du renvoi introuvable.):

the materials Collection,

the Reflection, that is a dialogue between the subject and materials, considering goals and results,

the Reduction, where materials are connected with standards,

the Display consisting on organising the materials to publish them.

![Fig. 1 - Stages of Portfolio Development Circle](image)

According to the PDC, after an initial section with the subject's personal info., the portfolio includes the Educational Philosophy divided in personal, political, professional, pedagogical purposes. Then, skills, achievements and a personal profile are written in a Resume, structured in sections (identifying information, objective, education, related courses, experiences). In the Autobiographical Essay, you can insert a narrative text about personal life, interests, and goals as the self-perception as a "future teacher". Evidence Documentation is the section where materials and relative reflections are inserted. Finally, the Checklist of content includes evaluations on some aspects of learning.

Danielson and Abrutyn (1997) divide the e-portfolio building process in four steps, namely

Collection: to point out the aim, the user, the portfolio future use in order to choose which materials to collect;

Selection: to select the materials, pointing out the selection parameters according to the didactic aims already established;

Reflection: to include reflections in every section and a general one;

Projection: to check the materials and reflections about learning, in order to point out reached aims and select the future goals.

H. Barret (2000) uses and somehow modifies this model. She proposes to replace Projectation with Direction, to stress that in this section the subject focuses on his goal starting from his reflections on his portfolio. Moreover, she proposes to add the Connection, where it's possible to build links among (internal and external) documents and the publication phase, when the portfolio or a part of it is displayed and compared with others. In some cases, you take out of your portfolio (the work portfolio) a presentation (the presentation portfolio) and you show it to a selected target (superiors, teachers, parents, class, school, out of the school) in order to point out reached goals and the way to reach them.

Thanks to the connection insertion, the contribution of the network is definitely emphasised.

In other words, Barret's model becomes the following:

Phase 1: Defining the Portfolio Context and Goals (key words: aims, users, role, evaluation)

Phase 2: The working portfolio (key words: collect, insert, project, plan)

Phase 3: The reflective portfolio (key words: choose, reflect, manage, develop)
Phase 4: The connected portfolio (key words: analyse, improve, connect, implement, evaluate)

Phase 5: The presentation portfolio (key words: celebrate, present, publish)

Comparing Takona's model -created as a paper portfolio- and Barret's one -created as an e-portfolio, the differences between them are evident. In Takona's model, the development (process of the portfolio building) is different from the structure (product). The building phases can not be identified with the final product or with the portfolio organisation. On the other hand, in Barret's model, the process is the product (Lesh, 2002). The e-portfolio can be considered as an ongoing learning tool (an "in progress" learning tool). The building phase is already public and shared by a small/medium group, so that a continuous inter-subjective monitoring is favoured.

The e-portfolio connects participation and reification (Wenger, 1998), participation to a process and materials production, make easier courses where the process identifies itself with the product.

The experimental model

The experimental structure is divided in 5 phases (selection, connection, narration, direction, orientation).

As a first phase (selection) students insert text fragments that are meaningful in their process of professionality building. Inserted materials come from texts, notes, or from their personal diary, to proof their education philosophy and its origin. They can insert also meaningful sentences heard in class or fragments from their personal diary present in their own space. Students explain the reason of the choice of every fragment and every fragment matches with the relative explanation.

The tool allows to insert online the fragments, one after the other. The insert date is recorded for every fragment. Moreover, every fragment can be sent in the active map simply clicking on a near key.

In the second phase (connection) students create a map combining the previously selected fragments with keywords meaningful for didactics project (project, program, evaluation, listening, kinds of project, mediators). Map knots may contain texts written on purpose inside the map tools, or fragments/lexias taken from the first phase blog, or from the forum messages.

Here, a tool to build maps is used; students work on a local connection, then they send the map online as a changeable map, that can be used and modified by others. The map can be seen also online, while a suitable plug in is necessary to create or change it.

In the three following phases, students think back to the work they made and they structure it in different ways.

In the third phase (narration), students define their apprenticeship experiences according to their new theorical knowledge and they write a narration (Bruner, 1990). It becomes the linear tool to reflect on and structure the work they carried out. Re-arranging together the fragments in a texts, a student gives his interpretation of events, kaleidoscopically reconstructing his identity (Wenger, 2002).

A tool to upload files made with a standard word editor is used.

In the forth phase (direction), students fill online a partly structured form, where they should point out positive and negative aspects of their preparation, learnt skills, and competencies not yet developed. The forms is divided in three parts. First, the students shortly sum up theorical topics, that were confirmed during the practice; secondly, the critical elements in contradiction with their proposals, and/or elements with which the students tried their own solutions; finally, the third part focuses on open questions, that is critical unresolved difficulties and doubts without answers.

The tool is a three parted form to be filled in online.

In the fifth step (orientation e connection), students represent their idea of teaching professional with a map. In this case, students use a networked structure to
represent their idea of the teaching profession, stressing the main elements and the relative connections among them. In this case as well, students may use fragments from other sections to build up the map.

The tool is the one already described.

**Technology support and environment description**

The e-portfolio, as already explained, is inserted inside the online environment supporting the traditional didactics.

![Home page](Errer ! Source du renvoi introuvable.)

From the home page, where you enter with a password, you can enter **WHO WE ARE**, that is the list of students. Clicking on a student's name, you enter his personal page, with a self-presentation, a photo and two links: one to his **blog** (where other students can insert their comments), the second to his **e-portfolio**.

The e-portfolio first page is a table with things-to-do and relative links to the necessary tools. The whole environment has an ASP structure.

**Main elements and technical features of the e-portfolio.**

Before describing the test, a short description of the main elements directing the e-portfolio technical-didactics project is necessary:

1. **The e-portfolio is a section of the online learning environment** supporting the teaching activities. It is not an isolated tool. The environment includes materials given by the teacher, theory and laws referrals. Moreover, during all the year students enter the environment for many activities: in the **forum** they debate about themes, they compare their experiences, add files, and relevant bibliographies, they focus and give their interpretation to theoretical aspects explained in class. If we consider the last three years' forum, often students refer to their personal experiences, their need (rarely expressed elsewhere) to check theories according to their past experiences. The environment becomes a great database, from which meaningful materials can be selected and added in the e-portfolio.

2. **The environment and the e-portfolio tools allow to link and combine writings.** In other words, students can select and insert textual fragments in the e-portfolio tools from the **web forum** (where students debate the main themes of the discipline), from the **documents download** (where they insert texts/materials for the activities they have to do during the course), from the **notice board** and from the **blog**. In such a way, texts and maps construction is a sort of combinatory patchwork. More in detail, it's possible to re-construct ideas and steps with maps, which knots are other tools' messages or with link connected with other tools. "Save as a knot" is a key present in the **forum**, in **documents** and in the **blog**, so that the message, the document or the selected text can be automatically sent in a knot of the active map. Later, when the student opens the **map** tool, in that map where he sent the message, saved knots are on the left, but their position can change and they can be linked with other knots. The map can be saved online and can be locally modified; moreover, it can be modified at any time by different users.

3. **Different rhetorical methods** are required to write the e-portfolio materials. Some materials have a **linear narrative structure**, where narration permits to give an interpretation of individual experiences. A **networked** structure is used for other materials, where the meaning results out of a space organisation of ideas (logical maps). Some activities can be half-structured (forms with questions), others not structured at all (open texts).

4. In the **e-portfolio sections**, students use **different networked tools and languages.** As already described, the e-portfolio includes scripts made with maps, text editors, blog and forum. Moreover, different media languages are included in the e-portfolio: video, images, drawings together with texts. Different operative processes made with different tools produce different crossing of the same themes, supporting the reflection on personal works and past writings.
The experimental test took place in Udine University Primary Education Faculty. The course consists of initial training of kindergarten and primary school teachers. The e-portfolio is connected with Theories and Methods of School Programming course, with the didactic lab. and with the practice followed by students of the third year. The e-portfolio can be defined as a short history, as it gives a one-year picture of students' activities and record their idea of teaching profession acquired at school. The 30-hours course consists on 10 lessons in class and online activities (web forum). It is supported by a 30-hours lab. inside the university, when students simulate the activities carried out in primary school. After that, students spend 75 hours in a primary school, testing didactical courses planned by them according to a definite structure. The structured activity supports the goals achievements and allows the e-portfolio realisation. Actually, the multiple activities (lessons, labs, placed activities), the relation with experts (teacher, supervisor-tutor, school receiver) offer a vision from many points of view, creating a place rich with impulses, among which the student has to choose and plan his own solutions. As in a mirror, the e-portfolio has to reconstruct past experiences, showing positive and negative aspects.

In 2002-2003, the test involved more than 80 students, while in 2003-2004, 125 students were involved. Actually, the 2002-2003 structure was simpler that the one used the second year.

Before the analysis of the materials, the project models should be explained. A contamination among deductive, inductive and abductive logic is present (Gero, 2002).

**A Model: two synchronic routes**

The first model describes two parallel routes, the one is the mirror of the other, causing continuous changes before the final result. The first route starts with the determination of elements that compose the final product (programming) and their project/put into practice (in a separate way). These elements are not neuter nor can be combined in every way, as according to their properties they can be combined according to syntax (Ks), that is a group of rules. In this way, the product elaboration (D) is obtained. The other route starts from the desired result (learning), according to which the product (I*) is hypothetically thought, then an elaboration/interpretation (K) of the I* item takes place, to reach the projectual phase (D*). At the end of both routes, two results come out (D e D*); the project will be determined by their intersection.

![Figure 3 - Model A](image)

This model was made during the projectual phase and describes the reflection before and in action.

**B Model: two diachronic routes**

As in the first model, also in the second the A route starts defining the elements (V), their project, their realisation, their combination. The product elaboration (D) is obtained in this way. Then, in the projectual phase, the impact of the project is hypothetically thought with simulations and 'as if' (Schön, 1983) to improve some aspects. It should be asked if the product meets the initial requests, if it has a sense as a whole, if the direction is coherent with the initial aims. In other words, the D product is interpreted (K) to catch its global meaning, its efficacy and efficiency according to its aims. The product completeness permits to see its structure, its weak parts and its more effective connections. According to the interpretation, a model of the material/project/product can be built (I) and compared with the initial expectations (I*).

---

1 For deductive we mean a research process starting from general rules, applying them to a particular case, to reach determined (sure) results; for inductive we mean a process, where results reached in particular cases are used for a rule (probable); for abductive we mean a process, where from a result, that is normally associated with a rule, a case outcomes (Petofi, 2002) in our case, the rules are psico-pedagogical theories, the result is an effective learning/realised project, the case/situation is the project and the context.
The second route represents also the projectual model of the personal professional identity and the e-portfolio elaboration process, where students reflect on their projects. The e-portfolio elaboration is a reification of the personal identity, as the interpretation of his personal route, that is the second part of the U can be assimilated to the after-action reflection, where the personal professional model is reconstructed.

In the second phase of projecting and making their work, students adopted an inductive abductive logic. In the second part, that is the final reflection when they filled the e-portfolio, with a deductive abductive logic they analysed the process as an olystic complex structure.

| Final comparison among C = Final comparison between the initially hypothetical model (I) and the one (I*) deduced by the realised project; problems statement allowing to start the research on problems |
| V = constructions of project segments according to theoretical knowledge |
| Ks = laws and rules determining relations among elements in the specific context |
| Ki = interpretation of D |
| D = realisation of the project - description of the created model for the arrangement |

Ki and I* phases both respond to projectual step and to the e-portfolio realisation; in the after action reflection, the model of what we realised can be inserted. In this process, the e-portfolio represents an evaluation tool (actually, the final exam starts describing the e-portfolio) and supports the re-projecting of the personal professional identity;

Moreover, with the e-portfolio students acquire awareness, analyse their didactics projects, develop projects according to their personal models.

**Analysis of the materials**

Reading the materials, the following elements have been pointed out:

In the **selection**- that is the e-portfolio first section - students inserted 4/5 fragments as an average, some themes are often present, even if in different texts. These themes have been influenced by the course and the practice. They include the listening, the initial dialogues with children, the projectual flexibility, the didactical mediators' role. In every selection, however, students refer to a personal (often external to the school) experience, which was meaningful for their training.

**Narration** (third section) report articulated remarks on what has been made. A description of the practice is difficulty reported, while the majority of students adapt the theorical background to their personal experiences. In the narration as well, some themes are present in different e-portfolio. Many students are initially worried about children's answers (but after they realize that children could express their points of view); they are surprised for children's knowledge and potentials; they need a good
disciplinary background, creativity in choosing materials and mediators, flexibility in their work and inter-subjectivity (the mutual change with other students and teacher).

In the direction (section 4) students report their main difficulties and skills to be improved, as projects of an evaluation coherent with the chosen program, choice of a program model according to the context, the class management particularly in large classes.

Many students refer to a diary, where they wrote down experiences and notes on their practice. A lot of materials report their works, but they are not always valued nor used for the reflection.

ASP technology and a networked portfolio used without any specific knowledge (but surfing the net) make the e-portfolio a flexible tool usable by a large target. In the e-portfolio, just one plug in had to be installed for maps creation and it caused some difficulties.

Because of difficulties in plug in installing, some students created their maps with WORD and after they saved the maps as docs. Obviously, that WORD maps are different from maps created with the system tool, as the first are independent from other materials, while the second ones are evidently responding to the selected texts. In this last case, maps become a sort of puzzle, where the majority of pieces are fragments of the selection section.

**Evaluation**

For the e-portfolio evaluation, different methods have been used:

An rubric to evaluate coherence and awareness has been constructed;

Present themes have been analyzed with the Grounded Theory;

Materials present in the e-portfolio have been compared with other referral materials;

E-portfolio materials have been discussed speaking with every student.

**Analysis with qualitative reading**

The rubric permits to evaluate awareness and coherence.

**Parameter: awareness**

<table>
<thead>
<tr>
<th>Levels</th>
<th>% 2003</th>
<th>% 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little comprehension of duties and problems</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Description of the course (analysis)</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>And construction of meaningful interpretation of past steps, linking projects and practice, projects and theories, projects and different contexts. (awareness)</td>
<td>68</td>
<td>66</td>
</tr>
<tr>
<td>And according to the personal experience, enriches lab, theoretical aspects focusing on relevant aspects, stressing difficulties, building a relative personalized model (personalization)</td>
<td>17</td>
<td>21</td>
</tr>
</tbody>
</table>

**Parameter: coherence**

<table>
<thead>
<tr>
<th>Levels</th>
<th>% 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Different sections’ materials include incoherent and incomplete works.</td>
<td>3</td>
</tr>
<tr>
<td>Partially coherent texts; maps not connected with the texts.</td>
<td>27</td>
</tr>
<tr>
<td>Texts and maps are mutually coherent but maps are incomplete.</td>
<td>49</td>
</tr>
<tr>
<td>Texts and maps are mutually coherent and complete.</td>
<td>21</td>
</tr>
</tbody>
</table>

The content analysis stresses an improvement of teaching professionality, increasing explicit statement of implicit models and knowledge. Three kinds of critical elements were described in the e-portfolio: the initial under evaluation of children potential (71%), of disciplinary skill (36%), of children ability/skills to overcome difficulties (57%) and the overcoming of these difficulties is pointed out. In the majority of the e-
portfolio (80%), the listening has a main role (it’s reported both in theoretical texts than in narrations). Often, texts from the personal diaries are included, showing uncertainties and fear for activities, that often were positively made actively involving children.

**Analysis made with the grounded theory.**

The e-portfolio texts produced by students in section 1 (selection), 3 (narration) and 4 (direction) have been examined with an ethnographic method, to point out statements providing elements to evaluate skills and ability acquisition during the course. The analysis method refers to the Grounded Theory model (Glaser, Strauss, 1967). The data interpretation goes on through the development and encode of categories starting from the data themselves; the three following steps can be distinguished (Cicognani, 2002):

- open encode (to create fragments out of the data and point out the first concepts)
- axial encode (to mutually connect the above mentioned categories, dividing them in groups; the researcher passes from the inductive -development of concepts/categories/relation starting from the text- to the deductive way of thinking –concept verification, categories/relation as regards as the text)
- selective encode (to elaborate more general abstract categories, to shape an outline at a superior level compared with the above mentioned categories).

The re-attributing by two other judges the categories to the texts fragments used by a third judge reached a result going from 90 to 100%, that can be seen as the fact that categories agree to the texts.

The following passage from first-level categories into superior level categories is the most controversial result, also because of the complex and theoretical similarity of the used categories.

The following table shows the way we followed for texts categories:

<table>
<thead>
<tr>
<th>Author</th>
<th>Text</th>
<th>First level category</th>
<th>Second level category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serena</td>
<td>…Never before I have been thinking about what kind of teacher I would like to be,</td>
<td>Reflection on personal professional identity</td>
<td>Growth of reflexive dimension</td>
</tr>
<tr>
<td></td>
<td>How I will use what I learnt in University courses…</td>
<td>Use of texts and study depending on the construction of personal and professional identity</td>
<td>Change personal study method</td>
</tr>
</tbody>
</table>

Here follows the categories detected by the researcher and shared in a sort of similar coupling between textual fragments and categories:

<table>
<thead>
<tr>
<th>First level category</th>
<th>Second level category</th>
</tr>
</thead>
<tbody>
<tr>
<td>More reflexive study methods</td>
<td>Growth of reflexive dimension</td>
</tr>
<tr>
<td>Reflection on class course</td>
<td></td>
</tr>
<tr>
<td>Critic awareness of personal interventions, ability to select strategies for an improvement</td>
<td></td>
</tr>
<tr>
<td>Attempt to personalize the course</td>
<td>Change personal study method</td>
</tr>
<tr>
<td>Importance of disciplinary epistemology</td>
<td></td>
</tr>
<tr>
<td>Awareness of the importance of a specific language</td>
<td></td>
</tr>
<tr>
<td>Use of texts and study depending on the construction of personal and professional identity</td>
<td></td>
</tr>
</tbody>
</table>
Importance of planning and projecting
Importance of observation and context
Difficulties in linking theoretical and practical needs

<table>
<thead>
<tr>
<th>Importance</th>
<th>Planning and projecting</th>
<th>Promote a mutually positive connection between theory and practice</th>
</tr>
</thead>
</table>

As regards as the research hypothesis, the evaluation shows that:

The attention to the reflexive dimension (hypothesis no.1 to improve the teachers' skills, have more explicit models and knowledge) can be appreciated both in the frequent referrals to reflection activities made to fill in the e-portfolio and to prepare the required works.

The frequent referrals to a positive influence between theory and practice (hypothesis no.2 to support a continuous circuitry between theory and practice, expert models and students conceptions) produces the use of studied notions, the critical re-thought of didactic actions, the attempt to select strategies to solve practice problems.

The change of the personal study method (hypothesis no. 3 to change and personalise the University students' study method) is described in terms of a superior awareness of personal study method, an attempt to use learnt notions to build a personal identity; it is evident a mature vision of the study and a research to personalize learning processes: “many times I feel the need to personalize my course…”

**E-portfolio comparison with previous surveys**

At the beginning of the course and practice, we asked to the students to explicitly state how they would have prepared the exam. Here follows the results:

<table>
<thead>
<tr>
<th>Level</th>
<th>% 2003 survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The hypothetical course is only based on notes and book (form of the beginning of the year)</td>
</tr>
<tr>
<td>2</td>
<td>The study is based on the course and it is followed by connections among different (form of the beginning of the year)</td>
</tr>
<tr>
<td>3</td>
<td>Present a course with a first part of theorical study and a second where theory and practise should be compared to develop new models.</td>
</tr>
</tbody>
</table>

In the present academic year, answers passed from 0% to 17% in level 3 of the same survey. According to our opinion, this difference is related with specific reflection steps made during the second year. These steps activate procedures similar to the e-portfolio ones: web forum, writing, materials sharing (as reported also by V.M Varisco in this same conference).

Great differences can be pointed out by comparing students' initial ideas with the ones after the use of the e-portfolio. Only 12% of the students inserts theorical referrals and described the practise without connections, while 34% connects theorical and practical experiences. For 54%, study is a way to check and improve their professional model.

The majority of e-portfolio has a strong link between the first section (selection of meaningful materials, where often practice materials are reported 64%) and the third section, where a narration/reflection on the practical apprenticeship is present. In many cases (79%) the narration supports the theory and discusses them. The e-portfolio production forced to reflect on personal professional identity and the exam preparation did not aim to study books, but to reflect on personal identity (considering books as well).

In other words, the e-portfolio helped to reach two goals already mentioned:

- hypothesis no. 2: to support a continuous circuitry between theory and practice, expert models and students conceptions; to increase the students' awareness of the way they plan the didactics;
- hypothesis no.3: to change and personalise the University students' study method.
The students' final remarks pointed out the circuitry between theory and practice caused by the e-portfolio. Remarks about the way the e-portfolio changed their methods of studying are even more.

Here follows very short fragments written by the students at the beginning of the year (a) and in the e-portfolio (b).

a. From the form filled at the beginning of the academic year by Irene

Before starting to study Theories and Methods of School Programming, I thought to distinguish different steps, to organise the study at the best...that is: I decided to do first the theoretical notions, then to read and focus on books, notes (of lessons and practice) and on online materials; after this first part, I'll "try" to build the e-portfolio (supported also by language contribution available online) and after, the thematic maps of messages inserted online.

b. From the form filled at the beginning of the academic year by Monica

I thought to read the books and check notes of the lessons and of the practice; then I can compare them with present and past laws, pointing my attention on a disciplinary topic as an example. At this point, I will focus on key words, as mediators, listening, skills...and I will be engaged in building the e-portfolio, with language helps, online messages and opinions by other students. The e-portfolio will be surely useful to focus on relevant knots of programming and to organise my knowledge and materials.

b. From the e-portfolio of Monica

The maps and the clinical talk revealed my true expectations and let me understood that I underestimated the children knowledge. This moment was meaningful for my course: I understood that it's easy to fall in frequent prejudices, you have to pay daily attention to understand the event being flexible.

b. From the e-portfolio of Anna

It is a particular form of critical reflection, operated by the subject on himself about his skills, but also on his ability developed at the end of the course, activity or simply after an experience.

For me, the listening resulted to be the most useful phase to improve my professionalism but at the same time it was the most difficult, as I could not always establish a syntony with the world experienced by all the children.

b. From the e-portfolio of Serena

In the three communities (lessons, practice, labs) there are different attitudes, as every activity has its own language, its operative and research processes. They are different but they aim to the acquisition of projectual skills. [...] It is as if those three different spaces would produce a three dimensions object. There should be coherence in the diversity, that is the produced object should be the same even if it is seen from different point of view (fragment)

The "produced object" is not only some projectual didactic thing, but it's also us, students of the Education Faculty, it's "me"......Never before I have been reflecting so much about what kind of teacher I would like to become, about how I will use what I learnt at university, on where teachers and supervisors want to arrive using their "big words" during the meetings of indirect practice and labs. Thinking back now, out of the things, I understand how important are the referring points we can count on, and how important is the way they were introduced to us. It is
Conclusions

During final dialogues, we asked to students their opinions about the e-portfolio. Many comments are similar and stress:

- The initial worry of a new tool;
- The changed role of the e-portfolio, from the initial phase (when it was considered the tool to structure the knowledge) to the final phase (when it was appreciated as a tool to focus on personal professionalism);
- the changed way to study and their way to conceive teacher profession.
- Moreover, some problems and remarks were pointed out and will be useful for next experiences:
  - the debate during the exam permitted to focus on themes/aspects not appeared in writing;  
  - the materials sharing is considered highly useful;  
  - the need to avoid the use of a plug in.

The first element confirms the need of a balanced evaluation. Kay Burke (2002) and Robin Fogarty (1998) proposed a portfolio as an evaluation tool, requiring a balanced approach to the evaluation. Bianca Maria Varisco (2004) proposes the same approach, as a balanced evaluation favours an authentic assessment. The final dialogue has a main role. The teacher can test the awareness of what was written in the e-portfolio, while the student can see what he had written from a different point of view. Undoubtedly, the online forums among students of similar courses at different universities influenced their awareness. The comparisons of courses, their structures, the practice started reflection processes, which are similar to the e-portfolio aims (as reported by B.M.Varisco during this conference).

The second aspect is related with the relevant sharing of e-portfolio. For many students, comparing and discussing their e-portfolio before the exams was a positive attitude. In 2003, e-portfolio could be always seen. Many students reported that they could better see themselves better and understand their choices by reading other students’ productions. In 2004, materials could not be seen by everybody. This limited the above mentioned impact, as each one could compare his portfolio only with a limited number of colleagues.

Finally, the last remark refers to the need of a synergetic coherence between e-portfolio structure and curricula. This determines the e-portfolio efficacy and exalts its orientative feature. At the same time, it becomes difficult to evaluate how much it influenced the students’ awareness and reflections and when other activities and the projectual coherence itself.

Two students see the e-portfolio in the following way:

At the beginning, I was extremely worried about the e-portfolio. Then I started to work on and structure it and I understood that it is really a great "invention". I see it as a sort of rucksack that you carry in a long difficult trip. In the rucksack, I can find all the things to go on in the most comfortable way and to overcome some obstacles. I hope that this metaphor is explicit enough to let you understand my opinion and my evaluation of the e-portfolio (Monica)

The second student wrote:

When I started to study for this exam, I read and studied as I usually do for all the exams. Then I started to fill in the e-portfolio. I
thought I had to write down things already studied, as it happens when I sum up or make outlines of the books I read.

Soon I noticed that something was wrong. I had to collect all the materials, I put them on my desk, as in a market table. All the materials were speaking to me in a new language, as if they were not only talking to me but also talking the one with each other and with my experiences. Those connections among them did not easily come out of my traditional outlines.

At this point, I had a second problem: what I could select (books, notes, web pages, practice materials, materials filled in by the children), as materials were huge. What does "the most important" mean? Finally I understood that I was the parameter to decide what was important. In other words, I decided to select the most meaningful materials for my training progress, the things that impressed me when I was reading, that are/will be more meaningful for my and teaching profession, that are deeply linked with my practice experiences. An aspect is striking and deeply motivated me: I was building a portfolio that was only mine, even if materials were present also in other portfolio (Elisa).

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Evaluation Criteria for Digital Portfolios: A Pedagogical Perspective for Higher Education
Evaluation criteria for Digital Portfolios – A Pedagogical perspective for Higher Education

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Abstract: In this communication it will be presented a proposal of evaluation criteria in order to assess digital portfolios in higher education from the pedagogical perspective. For this descriptive study it has created a set of pedagogical criteria in order to detect what types of digital portfolios are being used in different universities. It will be discussed this instrument and its results obtained through it. Finally, the conclusions will contribute the research for improving the new styles of learning supported with ICT in general, and with digital portfolios in concrete.

key words: Digital Portfolio, Electronic Portfolio, Higher Education, Virtual Learning, Alternative Assessment, Quality Learning

1. Introduction

Educational Portfolios in electronic format have lived a parallel revolution to ICT development in the educative world during these last years, showing their capability to increase academically learning and professional growth in higher education. They have been transformed in their recent electronic nature and starting to be well known as an “electronic portfolios” or “e-portfolio”. However, it is important to point out that for this terminology could be understood a portfolio with an electronic format, which could include an analogical media as its products (artifacts, reflections, etc.), while a “digital portfolio” is a portfolio which products are digitalized (Barrett, 2001). In addition to this, in this article will be used the common terminology “ePortfolio” to reference to both portfolios in general, except in the section about this descriptive study based exclusively on a web-site environment university portfolios.

E-portfolios also have the potentiality to give the opportunity for guiding the process of learning (and teaching) in virtual learning environments, increasing different kind of new and traditional learning skills in the student: technological skills, communicative skills, organisational skills, reflective skills, and sharing the knowledge reflected on the ePortfolio using the possible forms for maintaining communication with other e-portfolio’s owners, with the teacher (or other support staff: tutor, administrators, etc.) and, above all, with their own through reflection and /or self-assessment, as an autonomous learner (Little, 2004). The final purpose is improving the own knowledge as a future professional and lifelong learner in this society.

2. Electronic Portfolios in Higher Education

The e-portfolios are starting to be used massively in universities around the world, above all in U.S.A, U.K., North of Europe and other countries in it, Australia and some Asian Countries. The possibilities that e-portfolios are given as tools of learning and promotion are being increased for its digital nature, which provide considerable benefits (Kankaaranta, Barrett & Hartnell-Young, 2001). Furthermore, they are being used with different typologies of application depending on their purposes (learning/teaching, assessment or showcase) and their owners (students, faculty or institution), what implies in every case analyzes the dilemmas and take the best decisions (Barrett, 2003).

Nowadays, in Higher Education it is tried to find meanings that provide learning evidences (Cambridge et alt., 2001), for this reason the portfolios are being one of the alternative methodologies to develop and assess learning in universities. This is the point why e-portfolio is discussed as a tool for enhancing learning, taking as factors on it the communication and the collaboration among the participants in the process, and also for sharing experiences and resources. In this line it is suggested that a "shared e-portfolio" can support the construction of a "community of practice" (Tolsby, 2001).

Then e-portfolios in different electronic formats (commercial or non commercial) and ways to be applied, including actors that are taking part of this new form of learning/assessing/showcase in universities are not only making learning more engaging if not
giving to the learners a tool that could reflect their own learning expressed and managed by themselves with the facilitation of their teacher/advisor.


The focus of this research is to understand with a global and international perspective the current situation about this learning and assessment tool in higher education. This instrument was created for one typology of these pedagogical tools: Learning Digital Portfolio. It is focused in the university student, without specifying his/her major or level (graduate or undergraduate), who is considered as an active agent of developing his/her knowledge using this tool, auto-regulating his/her process of learning with the influence of other agents (like their teachers, peers, etc.), and being (formative/summative) assessed through it. The pedagogical criteria have tried to cover all the aspects, following the modern learning theories and the literature about criteria in e-portfolios and other ICT innovations (Barrett, 1999/2000; Britain & Liber, 1999; DiBiase, 2002; Grassian, 2003; McKenzie et al., 2002; Shoffner & Dias, 2002/2003).

The instrument is divided in three macro categories (see Figure 1) with eleven areas of pedagogical criteria. The structure of the macro categories it will be presented by indicators and their measures with a value assigned in function of the grade of absence or presence of the criteria in four levels of achievement: poor, average, good, and excellent (López Fernández, 2004).

Context of Digital Portfolios

The first macro category covers two areas of pedagogical criteria of the context: Multimedia Design (see Table 1) and Instructional Design (see Table 2).

| Navigation: Facility in the navigation for the e-Portfolio environment. |
| Poor: Linear presentation document. With no navigation links. Simple structure. / Excellent: Interactive presentation with animation and intuitive navigation; totally integration of Table Of Contents (TOC) in Product Learning Components (PLC) |
| User choice: Facility for choosing the way for navigating (interactivity). |
| Poor: No user choice in navigation / Excellent: Maximum and obvious user choice in navigation. |
| Appropriate use of multimedia (MM): Facility to use MM technology. |
| Poor: No use of MM or inappropriate use, distracting from TOC / Excellent: Maximum MM use, integrated in the presentation too. |
| Appropriate use of text: Facility in read the text (fonts, sizes, and contrast) being spelling and grammar correct. |
| Poor: Text is not or difficult for reading and spelling. Grammar is incorrect. / Excellent: Text is perfectly readable and spelling and grammar are correct. |
| Operational Fundamentals (OF): The OF (i.e. appearance, navigation, links, media, images, text and programming) applied throughout the e-Portfolio make the site functions well (following usability principles). |
| Poor: The OF are not clear, consistent, don’t work, are not optimized for the web and are inappropriate with errors. / Excellent: The OF are perfectly clear and consistent. All links work and media displays as intended. All is optimized for the web and without any error. |
| Copyright laws: Published materials respect copyright laws. |
| Poor: There is no respect for copyright laws./ Excellent: There is respect for copyright laws. |

Table 1: The criteria area Multimedia Design in Digital Portfolio
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Integration TOC in PLC: Integration of the table of contents with standards, artifacts and reflections in the Learning e-Portfolio.
Poor: Documents in original, separate files. / Excellent: Integrated, engaging, self-running multimedia presentation.

Organization of Academic Evidences (AE): Academic, co-curricular and personal evidences (i.e. organization, showcases, experiences and résumés) are shown throughout the structure design of the e-Portfolio.
Poor: There are no or few AE without organization./ Excellent: There are all kind of AE, very well organized and well connected between them.

Audience and Purpose: Description of the audience (roles as a future users, i.e. faculty members, peers, etc.) and purpose (being explicit and clear, summarizing the overall of TOC and PLC) of the e-Portfolio.
Poor: Lack or poor description about the audience and the purpose. / Excellent: Detailed description in one of the main parts of the e-portfolio about its audience and purpose.

Educational Philosophy: Appearance of the educational philosophy which is underlying of the e-Portfolio. It is incorporating current best learning practices and usually is selected by the institution or the faculty members.
Poor: Absence or incomplete philosophy statement (i.e. is not supported by references). / Excellent: Educational philosophy is explicit, well developed, and well written. The statements are adequately supported with all the references.

Virtual Learning Environment (VLE): Description of the virtual learning environment of the e-portfolio. The main VLE elements include: theme, purpose/goals, structure of the TOC and PLC, users, navigation model, and communication tools are integrated in the website.
Poor: Absence or incomplete description of VLE (i.e. theme poorly defined, goals not clearly specified, structure of TOC and PLC confused, unknown users, etc.) / Excellent: Required VLE elements are well developed, described without errors. The evidence show the relationship between these present elements complemented with other necessaries to create a meaningful learning environment for the student.

Table 2: The criteria area Instructional Design in Digital Portfolio

<table>
<thead>
<tr>
<th>Component</th>
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</thead>
<tbody>
<tr>
<td>Artifacts</td>
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<tr>
<td>Standards</td>
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<tr>
<td>Reflections</td>
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</table>

The second macro category covers two aspects, the Product Learning Components: Artifacts (see Table 3), Standards (see Table 4) and Reflections (see Table 5), and the Process Learning Components: Assessment (see Table 6), Feedback (see Table 7) and Presentation (see Table 8).

Organization of artifacts: Facility to find, open and view the artifacts in the Learning e-Portfolio.
Poor: Artifacts are not or poorly organized./ Excellent: Artifacts are well organized following a classification.

Variety in Typology and Expertise: Variety of artifacts: in typology (i.e. papers, essays, websites, web quests, e-books, etc.) and in level (i.e. novice, advanced, expert).
Poor: There are no variety of artifacts (in typology and level). / Excellent: There are total variety (in typology and level) with a clear organization (including their relation to standards or learning goals).

Appropriate content: Relationship between the content of every artifact and the objective, learning goal or standard pre-determinate.
Poor: Content does not relate with the instruction of the student in the program./ Excellent: The content of all the artifacts are appropriate for their learning goals in that moment of the program, using all resources available in the moment of creation.

Creativity of the artifacts: Grade of the creativity of the artifacts in terms of design of content, form of implementation and selection.
Poor: The artifacts are usual and no present any creativity. There is no or poor imagination. / Excellent: The artifacts are unique and present creativity in all of the specified terms, making the e-Portfolio original. Highly imaginative.

Table 3: The criteria area Artifacts in Digital Portfolio

| List of standards: List of the standards (and their description) that are necessary for accomplish every statement of the e-Portfolio. |
| Poor: There is no list of standards./ Excellent: There is a complete list of standards, with the clear description of everyone. |

Grade of understanding: Integration of the table of contents with standards, artifacts and reflections in the Learning e-Portfolio.
Poor: Documents in original, separate files / Excellent: Integrated, engaging, self-running multimedia presentation.

Achievement of Academic Evidences (AE): Grade of achievement in the academic, co-curricular and personal evidences (i.e. schemes, showcases, experiences and résumés).
Poor: Lacking or poor presence of AE, not well developed./ Excellent: All kind of AE integrated in the whole e-Portfolio, showing breadth and depth in the knowledge and skills acquired.

Table 4: The criteria area Standards in Digital Portfolio

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Connection between reflections and artifacts: Relationship between the reflective comments about every artifact (as an evidence of learning) in the e-Portfolio.

Poor: Absence or poor reflection in all the e-Portfolio. It is more descriptive than reflective. / Excellent: Every artifact is accompanied by its reflective comment, well developed and well organized.

Meta-Cognition: Degree of Meta-Cognition and Reflection: turning the collection of artifacts in the e-Portfolio in a reflective learning tool. In other words, what these evidences (artifacts) tell about the students' process of learning.

Poor: No reflection. Not mentions of standards or learning goals. Simple collection of artifacts, as a MM presentation. / Excellent: Reflections on the role of each artifact in the portfolio, including feedback of others and self-evaluation.

Level of Reflection: Degree of thought in the critical analysis of the artifacts and other detailed and global reflections.

Poor: No evidence or poorly level of reflection. No or minimal effort shown. / Excellent: High level of thought in critical analysis and reflection about every artifact (summarized and extensively) and all the e-portfolio. Considerable effort shown.

Overall reflection of the e-Portfolio: A global reflective comment about the e-Portfolio. It provides an analysis of all the reflections made during the construction, closing the process, and giving to the student self-knowledge as outcome of his/her learning too.

Poor: There are no or poor global reflection (i.e. it is short and difficult to find it or no cover all the aspects in general terms). / Excellent: In some space of the e-Portfolio, clearly appeared an overall reflective comment which integrate and depth in the reflective aspect of the e-Portfolio.

<table>
<thead>
<tr>
<th>Table 5: The criteria area</th>
<th>Reflections in Digital Portfolio</th>
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<tr>
<td>Criteria for assessment: It is explicit what will be the criteria for assessment. It could include the criteria for selection artifacts, revise the reflections and judging merit in general.</td>
<td></td>
</tr>
<tr>
<td>Poor: There are no evidence of the criteria for assessment./ Excellent: There are evidences of the criteria for assessment, clear and well defined.</td>
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<tr>
<td>Opportunity in order to create his/her own assessment: Possibility for the students to create his/her owns materials for assessing their own product learning components during the process of construct the e-Portfolio.</td>
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<tr>
<td>Poor: There are no possibility for any self-assessment during the process of the e-Portfolio. / Excellent: There are offers for the VLE of the e-Portfolio for doing this self-assessment and space for creating it and include it.</td>
<td></td>
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<tr>
<td>Opportunity in order to participate in assess other peers: Possibility for participate in different forms (i.e. establishing communications with peers for advising, make suggestions, make constructive critics, give ideas, interchange opinions, etc.).</td>
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<tr>
<td>Poor: There are no possibility for participate in assess others./ Excellent: There are functions in the e-Portfolio for facilitating this participation in assess others.</td>
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<tr>
<td>Instruments for assessing the PLC during the process: There are instruments created for using them.</td>
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<tr>
<td>Poor: There are any instrument of assessment. / Excellent: There are instrument with its clear specifications for being applied.</td>
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<tr>
<th>Table 6: The criteria area</th>
<th>Assessment in Digital Portfolio</th>
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<tr>
<td>Between the student and his/her teacher: Didactical conversation between the student and the teacher during the process of constructing the e-Portfolio</td>
<td></td>
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<tr>
<td>Poor: There is no or poor feedback between them./ Excellent: There is rich feedback between them, with spaces and moments prepared for it.</td>
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<tr>
<td>Other participants: Didactical conversation between the student and the peers and other persons implicated in the learning process of the student, during the construction of the e-Portfolio.</td>
<td></td>
</tr>
<tr>
<td>Poor: There is no or poor feedback between them. / Excellent: There is rich feedback between them, with spaces and moments prepared for it Communication tools: As in all VLE, in an e-Portfolio, for guarantee the communication between the student and the teachers (and other participants) it is necessary the appearance of some communication tools (i.e. email, forums, etc.).</td>
<td></td>
</tr>
<tr>
<td>Poor: There are no communication tools in the e-Portfolio../ Excellent: There are the necessary communication tools and the specifications for make a good use of them</td>
<td></td>
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<tr>
<td>Validation of the learning evidences: Feedback is considered as the final element that validates the artifact and its reflection associated as an original evidence of learning.</td>
<td></td>
</tr>
<tr>
<td>Poor: There is no or poor feedback in the e-Portfolio. / Excellent: There is feedback related with every PLC.</td>
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<tr>
<th>Table 7: The criteria area</th>
<th>Feedback in Digital Portfolio</th>
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<td>PS5 - Evaluating ePortfolio use in Higher education</td>
<td>142</td>
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</tbody>
</table>
Development of Academic Evidences (AE): Grade of development in the academic, co-curricular and personal evidences (i.e. schemes, showcases, experiences and résumés).
Poor: In the documents presented it is difficult to observe any development./ Excellent: In all documents presented is perfectly observable the development of the student.

Learning goals: Grade of development of short-term and long-term learning goals (personal or professional) during the process of constructing the e-Portfolio.
Poor: Lack or poor presence of learning goals. / Excellent: Detailed description of all kind of learning goals, including what are achieved and what needs improvement.

Portray of the owner: It is considered that the e-Portfolio acts like a mirror capturing the learning process and reflection (with personal beliefs and values) of the student, showing in its final presentation a portrait of his/her learning behaviour.
Poor: The final presentation not show a clear portray of the student./ Excellent: The final presentation show a clear portray of the student throughout all the elements of the e-Portfolio.

Culture of Evidence: In this perspective, e-Portfolios are supported by the integration among artifacts + reflection (rationale) + validation (feedback), and the result (=) of this is the “evidence”.
Poor: Based on these elements there are no evidence (i.e. if there is no feedback). / Excellent: Based on these elements there are evidences clear and well presented.

Final components: The components of the e-Portfolio (product and process) that are shown in its final presentation in the web-based environment.
Poor: Few components are shown. / Excellent: All components are shown.

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<tr>
<th>Table 8: The criteria area Presentation in Digital Portfolio</th>
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3.3 Agents of Digital Portfolios

The third macro category covers: Individual Learning (see Table 9), Social Learning (see Table 10) and Individual and Social Learning (see Table 11).

Originality: The unique capacity of the individual in order to create his/her own knowledge based on his/her personal perspective.
Poor: There is no originality in any component of the e-Portfolio./ Excellent: There is originality in all the components of the e-Portfolio.

Autonomous Learning: Individual process of learning that increases the structures of knowledge and allows selecting the relevant aspects of problem situations. This produces the conceptual change that replaces old structures of knowledge with new meaningful knowledge that improve the cognitive capacity of the student.
Poor: There are no or poor evidence of autonomous learning. / Excellent: There are clear and consistent evidences of autonomous learning.

Personal values and philosophy: Emphasize the own values of learning and the own philosophy about the education.
Poor: There are no or poor evidence about the personal values and his/her own philosophy./ Excellent: There are rich and clear evidences about the personal values and his/her own philosophy.

Communication: Establishing communicational processes inside the e-Portfolio for facilitating the social learning.
Poor: There are no communicational tools./ Excellent: There are different communicational tools for different communicational processes well defined.

Participation: Learning as a process of participation in various practices and shared learning activities and resources with others.
Poor: There is no or poor participation. / Excellent: There is participation very well regulated with opportunities for sharing resources.

Roles and Privacy: In the e-Portfolio are able different participants with different roles, consequently different privileges in access.
Poor: There are no participants or one (teacher), and all is private./ Excellent: There are participants well defined with their roles, and specifications about public and private sections of the e-Portfolio for every role.

<table>
<thead>
<tr>
<th>Table 9: The criteria area Individual Learning in Digital Portfolio</th>
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<tr>
<th>Table 10: The criteria area Social Learning in Digital Portfolio</th>
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</table>

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Integrate individual autonomy with social autonomy: Enrich the own personal work with the social communication (advices, suggestions, critics, ideas, etc.) and social activities (discussion, creating resources, etc.) with other participants.

Member of a “community of learning”: One of the objectives of the process of learning is to become a member of a community of learning, where cognition and knowing are distributed. As the future “intelligence communities”

Poor: The student is not a member of any community. / Excellent: The student is an active member in the community (and participate in others)

Member of a collaborative “network of learning”: Share products of learning and collaborate for creating new resources. The process of learning is inside the networks of people working in the same specialization with different background and ideas for sharing and constructing new knowledge (CSCL).

Poor: There is not participation in a network of learning. No share the resources. / Excellent: There is an active and engaged participation in a network of learning. Share resources and collaborate actively

Table 11: The criteria area Individual and Social Learning in Digital Portfolio

One of the main objectives in the construction of this instrument has been to show all the complexity of the digital portfolios in higher education, covering from a holistic perspective the aspects that are relevant in its development as a learning tool and as a formative and summative assessment methodology. It is basic to understand that a digital portfolio in higher education is not a simple tool; it is considered that a well constructed portfolio can capture the complexities of learning.

Results of Pedagogical Criteria for Digital Portfolios in Higher Education: its application to a sample

In this descriptive study were selected three non commercial digital portfolios published on Internet from universities of different continents (USA, Asia and Europe) for being analyzed. Then were found similar and difference characteristics on them, depending of their conception of ePortfolio as a learning tool for a university student.

All of them were highly structured in their contextual aspects (multimedia and instructional design), above all the e-portfolio from USA and Asia; the European was giving more chance to the learner for taking decisions about the designs. All are supported for informative websites and other electronic resources (tutorials, models of other students, etc.) that explain and show their objective, methodology and purpose.

In reference to their components as digital portfolios, about their products all e-portfolios were taking care specially about the artifacts and the reflections (being this last factor a problem for the lack of culture in reflection for the part of students). The USA and Asia ePortfolio were more oriented to standards than European, more oriented towards learning goals. In all the cases the content structure of the e-portfolio was determining website platform (or it was perceived like this for the limited access to information). The process was more difficult to know for being needed more about the experience of educative professionals who are working on them. However, they show their possible presentation in website environment and the fact that they provide feedback (although not much communicative tools are on it, only emails), but it is not so clear their use as a tool of assessment in the university (USA and Asia are more institution oriented e-portfolios than European, that is more student e-portfolio applied for a course). In addition, all are showing the intention of being a bridge between university career and professional life.

Finally, all of them are trying to potential the individual learning and the own learner autonomy, having present the benefits of knowing and being in contact with others (not only the teacher, if not also the peers and other advisors). However, social learning is not enough developed yet and neither the link between both classes of learning (no communities of practice or networks are reflected in their e-portfolios). On the other hand, are showing other basic information about the learner a part of his/her curriculum vita and records, as for example: competencies, overviews, learning path, performances, among others.
5. Conclusion

The aim of this study in progress has been to provide a general view for helping to define an effective e-portfolio, which is developed in a virtual learning university environment based in all the learning components of the modern theories of learning. The present tendency of the new e-portfolios is to be more oriented to the autonomy of the learner, from the individual and social aspects of learning with a constructivism perspective. In general, it is considered one of the assessment tools that are improving the quality in the innovative processes of teaching and learning in the universities.

Furthermore, this instrument has let to make a depth reflection about what are the main pedagogical characteristics for an effective use of digital portfolios in higher education, and about future ways for continuing developing this assessment instrument understood as a methodology of the processes of learning and teaching too. Finally, it have been highlighted the main aspects in order to continue the research for improving the new styles of learning based in digital portfolios.

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7. Acknowledgements

The author present this research as a part of her doctoral thesis developed in the Institute of Educational Sciences of the University of Barcelona (Spain) and as a member of GREAM research group, with the fund of her pre-doctoral grant from the Ministry of Education and Culture of the Government of Spain.
PS6
ePortfolio national and regional policies
Integrating an ePortfolio within a University and the Wider Community

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Abstract: This paper discusses some of the factors that contribute to a successful implementation of an ePortfolio system, concentrating on the importance of integration, both technical and pedagogical. It draws on our experience of working on ePortfolio developments on three different levels: within a university; in a locality (between a university and a city education authority); and nationally (between two stages of education in the UK, Further Education and Higher Education).

Key words: ePortfolio; Personal Development Planning (PDP); integration; region

Introduction

In parallel with the roll-out of the government eLearning strategy, major reforms are going forward in 2004–05 in the education system in the United Kingdom (UK). The Department for Education and Skills (DfES) has sponsored a major review of the curriculum and qualifications for school students aged 14–19, the Tomlinson Review. Another DfES working party (the Schwartz Group) has just published recommendations for admissions to higher education, designed to support wider participation and help the UK achieve the target of 50% take-up of higher education by 2010. Both of these reports stress the wider diversity of kinds of students and types of learning and achievement which need to be recognised in the 21st century; they emphasise the individualisation of learning and the importance of holistic assessment. Information technology has a key role to play in realising their aims.

National project work on ePortfolios based in Nottingham, in a partnership between the University of Nottingham and the City of Nottingham Local Education Authority, is developing possible solutions to some of the practical challenges contained in these reforms. Our work is testing interoperability standards for ePortfolios in the UK and developing use cases around transition from further education (FE; mainly for students aged 16–19) into higher education (HE). The project includes key work with the Universities and Colleges Admissions Service (UCAS), which means that the impact should eventually be nationwide.

Background

All UK universities are preparing to meet a national policy recommendation that, by 2005–06, all students should have a formal transcript of their studies (Diploma Supplement) and also a Progress File (portfolio). The Progress File contains evidence of each individual student’s ‘personal development planning’. Universities are required to provide the structure and support for all students to engage with this. Many institutions are seeking IT solutions, and some (including the University of Nottingham) are looking to explore the relationship between the eProgress File and ePortfolios. The wider policy contexts surrounding this development include government incentives to:

- increase partnership working by universities in their localities and regions
- widen participation in UK higher education from about 40% up to 50% of the population, largely through admitting more locally-based students
- encourage student-centred learning styles
- quality-assure university teaching
- enhance the development of students’ employability skills
increase links between universities and employers.

Beyond the University: connecting ePortfolios in the locality and in the region

Considering the implications of the UK’s national commitment to lifelong learning, we have already experimented with extending the ePARs system to include others besides learners participating in current University courses. This has included prospective students prior to their registration with the University (via the New Entrant Profile), and graduates moving out into employment (ePARs for newly-qualified teachers working through their induction year as new professionals). However, an important current growth area is work to develop connections between the University, the locality and the region.

The University of Nottingham has been an active member of the CETIS special interest group chaired by Peter Rees Jones, which has been developing and testing application profiles in IMS LIP for the eProgress File in the UK. In relation to this work, Nottingham is in a unique position nationally in having an active partnership between the University’s ePARs system and the City of Nottingham Passport, an ePortfolio tool recently introduced into city schools. The City of Nottingham Passport has been designed to facilitate transition for individual learners between the key stages of secondary education. It includes tools to support individual learning plans, the development of personal statements and a curriculum vitae. It is being developed further for a new, formal transition process at age 16 between secondary and further education in the region, supporting both the business processes around admissions to Colleges of Further Education and the transfer and further developmental use of the individual learner’s ongoing personal and academic records.

The City of Nottingham Passport in context

The idea for the City of Nottingham Passport was first mooted in 2002 as part of the Aimhigher project to widen participation in Higher Education. The UK Government’s target of 50% of 18–30 year olds entering Higher Education by 2010 created a need for significant work in improving the quality of the transition process. Post-16 participation rates in the UK are low and if access to HE is to be widened students need to be encouraged to make the difficult transition at 16. At the same time the Department for Education and Skills was launching the Progress File, a set of interactive materials designed to help young people and adults to plan and manage their own learning more effectively. The principles and materials of the Progress File
and the principle of widening access to Higher Education are both deeply embedded in the City of Nottingham Passport.

The Passport also sits at the centre of 14–19 reform in the UK. The Government Working Group on 14–19 Curriculum and Qualifications Reform (The Tomlinson Report) envisages all students having an electronic ‘Transcript of Achievement’, whilst the Government White Paper 14–19: Opportunity and Excellence introduces an Individual Learning Plan for all students. Underpinning these developments is the concept of greater flexibility and the personalisation of the curriculum. A major thrust of Government policy is not only to encourage young people to take responsibility for their own learning but also to give them greater choice. The eventual aim is for each young person to have a personalised curriculum which fulfils his or her needs, abilities and career aspirations. The Passport was in part developed to help students make sense of this increased flexibility.

The Passport is currently used by 19 schools and four Colleges of Further Education in the City of Nottingham but there are plans to extend its use to more schools and colleges in the Greater Nottingham area.

Content of the Passport

The City of Nottingham Passport is an ePortfolio of a student's learning designed to be used at key transition points in his or her career. Students first use the Passport in year 9 (at the age of 13) but there are pilots to introduce it at year 6 (at the age of 11). Students register on to the Passport under the name of their institution and only they have access to their portfolio. All stored data can be printed off or emailed. The Passport is best delivered as part of a coherent Personal Development Programme. There have been attempts to create a more integrated approach to personal development planning, but schools are often reluctant to give time to this area of the curriculum as it rarely contributes to their position in league performance tables: however, Tomlinson sees personal planning and review as part of the core curriculum.

The Passport is structured around the three key stages of learning: key stage 3 (11–14), key stage 4 (14–16) and key stage 5 (16+). Each key stage can be accessed separately to afford some differentiation, but data stored at one stage is automatically forwarded to the next, to allow for review and editing. Thus when students move on to the next stage of their education, they take their existing data with them. As areas of the site are common across all key stages, it is relatively straightforward to include additional sections. Currently there are four main areas:

- Personal statement
- Curriculum Vitae
- Individual Learning Plan
- Recording Achievement
- Within each area there will be:
  - introductory text
  - examples
  - templates for creating documents
  - editing facilities
  - links to other sites providing advice and guidance.

In the Recording Achievement section it is possible to enter a range of qualifications which will be converted into points. These points are collected towards the City of Nottingham Achievement Award which is in line with the Tomlinson Review’s proposal for one overarching diploma. Such a proposal is a major departure from previous UK practice. The Diploma can be awarded at four levels: Entry, Foundation, Intermediate and Advanced.

Together the four elements of the site form the student’s portfolio. This is the basis of the Passport which is carried forward to a new key stage. Future developments are concerned with how to improve the use of this data at the point of transition. One such development is the involvement of the Passport with the University of Nottingham.
Students from a local Further Education College have been using the Passport to write their Personal Statements for university applications. Work is continuing with university admission tutors and UCAS to see how the personal statement can be refined in both pedagogic and technical ways. Pedagogically, the Personal Statement is central to the debate on Fair Access to Higher Education as outlined in the recent Schwartz Group report. Technically, the tagging and transfer of data from one system to another must be developed within an international framework. The outcome of the project with Nottingham University will determine the future form of the key stage 5 personal statement.

A more immediate development is the planned creation of an electronic application process to Further Education at the age of 16. Local colleges and schools are involved in discussion aiming to create a common admissions system with the Passport at its heart. The system will enable students to apply for Further Education by bringing forward data already stored as part of their personal development ePortfolio, and has the potential to be used for any application. The intention is to bypass the need for individually emailed applications by establishing direct links from the Passport to central admissions at Further Education Colleges.

Pedagogic Benefits of the Passport

It is too early for a detailed evaluation of the pedagogical effects of the Passport but it is possible to draw some initial conclusions.

Whilst data is continuously being sifted nothing that students include in their portfolios is wasted. At each transition point the data can be applied and showcased as required. This has an important motivational impact on students and encourages the self-management and self-review skills so necessary for career progression.

The process of recording achievement and linking it directly to career planning has a positive effect on self-esteem and confidence.

Aspects of the Passport such as the Individual Learning Plan encourage students to think and plan ahead, and therefore encourage progression.

The Passport supports learning generally, and especially in those areas of the curriculum involved with personal development.

Most importantly, the Passport puts the student at the centre of the process.
Administrative Benefits of the Passport

The Passport will eventually create a system whereby applications to post-16 institutions will be electronic and collected in a central admissions point.

We are seeking to create a portal which will allow electronic verification of a student’s data, particularly examination results. This would save Further Education Colleges a significant amount of time.

Colleges and Universities can receive a students’ ePortfolios before they begin their courses, allowing for a much smoother transition. In time this could replace the New Entrant Profile system currently used by the University of Nottingham.

Improved transition should encourage greater student retention and thus assist institutions in their planning.

A national ePortfolio for university admissions

While the University and the City of Nottingham continue to work together to smooth the transition of locally-based students on to undergraduate courses, their liaison over the development of ePortfolios in contiguous sectors of education has created a valuable operational testbed for initiatives in data transfer and pedagogic integration.

The University and the City have recently come together as partners (with the universities of Leeds and Paisley) in Specifying an ePortfolio, a national project to propose a set of enhanced learner information (a template for a presentational ePortfolio) for university admissions processes. The range of learner information requested is to be broader than before and also more effective in indicating aptitude and potential as well as traditional academic achievement. This represents a key development required to support the new kinds of students coming forward for higher education under the expansion of higher education in the UK.

Specifying an ePortfolio is funded by the Joint Information Systems Committee (JISC: www.jisc.ac.uk). JISC supports further and higher education in the UK by providing strategic guidance, advice and opportunities to use Information and Communications Technology (ICT) to support teaching, learning, research and administration.

A further crucial collaborator in the project is the Universities and Colleges Admissions Service (UCAS: www.ucas.ac.uk). UCAS is the central UK body that processes all student applications for admissions to courses in higher education. It therefore interacts with all the pre-university education providers in the country as well as all the universities.

Work is now under way to link together the City of Nottingham Passport with the UCAS admissions system and then with the University of Nottingham ePARs system, providing interoperability between all three, using the XML LIP protocol. Test data have already been transferred directly between the Passport and ePARs to support transition for increasing numbers of local students admitted under the widening participation policy. In the course of the coming year, data needed for application to higher education will be passed from the Passport to UCAS and from UCAS to the University, to test both the project’s definition of enhanced learner information and the interoperability specification, with a view to mainstream adoption by UCAS.

A major aim of the project is to demonstrate how, in terms of both pedagogy and technology, ePortfolio presentations for admissions will be able to draw upon on-line personal development records developed by individuals during their studies in 14–19 education, and feed into their on-going personal development planning, or ‘lifelong learning’ record, in higher education.

For example, a key section of the current UCAS application document is an open text box where the student writes a Personal Statement, designed to complement their formal assessment record with evidence of skills, personal attributes and qualities – key evidence for establishing aptitude and potential. At present, applicants write one personal statement as the basis for applying for six different courses, potentially at six different universities. As part of the process of completing a personal statement, a new web-based system might provide candidates with some or all of the following.
PS6 - ePortfolio national and regional policies

Prompts specific to the subject applied for

- Direct access to the on-line Entry Profile for the specific university course (including complete, fully transparent, admissions criteria), to provide
- Information about the course
- A source of structure to guide the writing of personal statements
- The facility to customise the Personal Statement in order to make it course specific
- The facility to hot-link assertions made in a personal statement to authentic evidence in the form of archived, dated entries in electronic Progress Files developed over a period prior to application, such as the City of Nottingham Passport.

The objective of this development is to achieve a potentially very rich presentation, capable of layered investigation by an admissions officer in some depth if required (especially for borderline cases), such that the face-to-face interview often used for non-traditional applicants would no longer be necessary. The potential depth of this style of self-presentation has extensive implications for ways of preparing students for applying to university and for styles of learning and teaching in schools and colleges; however, the implications are extensively sympathetic to the thinking behind the holistic, increasingly student-centred proposals for 14–19 education which are anticipated later this year in the UK's Tomlinson Report.

For successful applicants, the new-style personal statement would be drawn into the university's information systems and provide a baseline self-assessment statement upon which personal development planning in HE could build. It would largely replace a current facility such as the New Entrant Profile (NEP), within the University of Nottingham ePARs system. The NEP provides a structure for a guided Personal Statement which incoming undergraduates complete in order to introduce themselves to their personal tutor (the academic who supports the student in taking an overview of their progress, as part of personal development planning). This is capable of providing developmental reflecting and planning activities for the student, and key information for business, administration and support systems in the university. Achieving genuine continuation between pre-university and university personal development planning, in technology and pedagogy, is a special objective of the Scottish arm of the Specifying an ePortfolio project, at the University of Paisley, where there is a focus on identifying students’ learning needs and planning course options and learning support on an individual basis as students make the transition from foundation courses taken in local further education colleges to honours courses completed in the university.

Institutional implementation of a student ePortfolio system

The University of Nottingham has been working for several years on the development of its electronic Personal Academic Records (ePARs) system, which manages a schedule of regular interactions between students and tutors for reflective reviews of academic progress and developmental planning. This system is gradually replacing paper-based progress files and is now in use in over half the Schools in the University. It has recently been enhanced with reflective, skills-evidencing functionality, called the Personal Evidence Database (PED). Groups carrying out early pilots of this tool include: industrial placement students in Engineering; students on a new Graduate Entry Medicine course, recording clinical competences and studying entirely through the medium of problem-based learning; and undergraduates self-assessing their progress on Community Action placements. A pilot study is currently under way to evaluate the usefulness of this system for managing staff performance appraisal evidence.

A design advantage of the ePARs system has been the importance placed on truly integrating it within the processes and operations of the University (both pedagogical and technological).

On the pedagogic side, the structure and support for students’ personal development planning has been based on an existing institution-wide system of personal tutoring with a quality-assured framework for individual review meetings. In developing
ePARs for students more firmly in an ePortfolio direction for the future, the challenge in the next phase will be to shift the emphasis from a tutor-led system to a learner-owned one.

It has also been important to the implementation of the institution’s IT strategy to ensure that there is complete integration of ePARs with other IT systems, so that use of the system carries no additional administrative overhead. To this end the ePARs system was designed to be totally integrated with the Student Records system, providing the necessary demographic and academic information needed by the tutor and student. Subsequently ePARs has been integrated within the University Portal, providing a single point of contact for students to access all information related to their course, and for staff to access all information related to their teaching and tutoring. The next section of this paper describes the integration techniques used.

Technical Integration within an institution

The ePARs development at Nottingham has been designed to be integral with other systems, to ensure that there is no technical barrier to the roll-out across the institution. Corporate administrative systems are all Microsoft SQL Server based, with integration work carried out by an in-house development team. For e-mail, calendaring and collaborative tools we use GroupWise. We also support Blackboard and WebCT Virtual Learning Environments, as well as other bespoke e-learning support systems.

Access to ePARs

Much research and development work is taking place with the HE community on the use of Managed Learning Environments (MLEs) providing access to both administrative and academic functions for learners and teachers. The University of Nottingham has decided that it will deliver this capability with a portal and is implementing this for the different stakeholders in the institution (students, staff, alumni, prospective students) to provide access to all on-line services. Currently all students and staff have access to their own customised view of the portal and many services can now only be accessed from the portal. The portal can be accessed from anywhere in the world across the internet, providing the ability for staff and students to stay in contact with their teaching or learning no matter where they are.

ePARs is accessed as a channel within the portal and is therefore easily accessible to all students and staff.

ePARs is located with the “My Course” tab of the student portal (Figure 3), together with information on subscribed modules, timetables and examination information. Module information provides links to the Virtual Learning Environment (VLE) resources. This area of the portal is therefore heavily used, bringing the ePARs system to the regular attention of the student, and so helping to encourage regular use.

Within the staff portal, ePARs is located within the “My Teaching” tab, again to raise the visibility of the system. This provides a separation for academics from their research content, which has its own “My Research” tab.

System Integration

The ePARs system has been developed tightly coupled to our Student Records system. Wherever possible data is shared between the systems, but ePARs does allow for additional users who are not recorded within the Student Records system to be included. This provides student and tutor with access within ePARs to module information and examination results as well as demographic information about the student, without the need to re-enter the information. Photographs are incorporated from the ID card management system.

User authentication is achieved via the central LDAP (Lightweight Directory Access Protocol) server. This allows a single username and password to be provided to students to access all University systems. It also provides the mechanism to allow single sign-on to ePARs via the portal.
One facility of ePARs is the New Entrant Profile for students to use before they start their course – the integration with the Admissions and Student Records system allows this to function before a student is registered for their University IT facilities.

We have also carried out substantial work with interoperability with other systems, based on the UK LIP XML schema. Current work includes proving interoperability between ePARs and the Nottingham Passport and coding the UCAS (Universities and Colleges Admissions Service) admissions system against UK LIP.

**Future Developments**

Plans are in hand for a number of significant developments which will further integrate ePARs into the Nottingham environment.

Currently ePARs contains its own calendar of tutorial meetings, etc. Students and staff also have access to a calendar within the GroupWise e-mail facility as well as within the portal. This can lead to confusion and missed appointments. It is intended to integrate the ePARs calendar and tutorial booking system into a standardised calendar so that all events can be seen together. At the same time, other functions which are duplicated in other systems (such as examination results, transcripts, etc) will be combined to further integrate the ePARs functionality into the mainstream.

The most significant development will be the expansion of the Personal Evidence Database into a full ePortfolio, allowing the storage, filing and publishing of a wide range of student experiences, including reflections, tutorial notes, assignments, skills records, work experience, etc. Current e-Learning tools will be integrated, so that assignments completed within a VLE can be referenced.

More important will be the integration with the range of the other portals which are in development. The portal project consists of a number of inter-related portals, tailored to a specific target audience. Student and staff portals for current members of the institution have already been mentioned: we also have a Prospective Student's Portal, which caters for enquirers, applicants and pre-registration students, and an Alumni Portal, which caters for graduates.

The ePARs and ePortfolio functionality will be integrated into both of these portals to provide functionality to support lifelong learning. Students will then be able to start using the system before they arrive at Nottingham, they will record their experiences at Nottingham, and then have the ability to continue to use the system after they have left, throughout their working life and any other episodes of structured learning.
later in life. Although the data will be hosted by the University, this will be on behalf of the individual student and not be for the institutional benefit.

References


Portfolios Through the Years: A School District Moves from Pilot to Full Scale

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Abstract: Over three years, the Bristol-Warren Regional School District has brought digital portfolios into its elementary, middle, and high schools. This work in progress describes how the district is moving beyond a discussion of the technology to a focus on issues of assessment (what makes a good task?), policy, reflection and staff development.

Introduction

Three years ago, the Bristol Warren Regional School District decided to examine its student assessment process. Teachers, administrators, and parents all saw a need to focus more on authentic assessment to monitor student progress towards the standards.

After much evaluation and review of various options, the Digital Portfolio was adopted. The initial implementation was with a small pilot group of grade 9 students at the high school level. Over the past two school years, the district has moved the implementation to schools at all levels: elementary (grades K-5), middle (6-8) and the high school.

The story of the implementation in the district coincides with several state and federal policy initiatives. As the federal No Child Left Behind act takes hold, students at the elementary levels will be expected to demonstrate greater skills in literacy and numeracy. Meanwhile, the Rhode Island Department of Education became the first state in the union to require “graduation by proficiency.” As opposed to states that are mandating standardized tests for graduation, Rhode Island is asking each school to specify how each student will, through the course of their school work, demonstrate that he or she has met standards. Thus, keeping track of information through portfolios has become more critical. Our primary focus remains helping teachers understand each student's individual progress; still, we can use the digital portfolio to help us meet these new accountability measures.

As we describe the work in progress, we can address four critical issues:

- At the high school level, teachers are currently asking, “What makes a good task?”
- Meanwhile, the high school faculty is also wrestling with the policy implications of our state’s “Graduation by Proficiency” requirement.
- In the elementary schools, students are learning how to use digital cameras to record their reading – and also learning how to reflect on their growth as a learner.
- Throughout the system, the portfolios require deep thinking about how we “go to scale.” The key to this process is creating and delivering appropriate professional development.

High School: What Makes a Good Task?

All students at the high school, starting with the graduation class of 2007, will need to submit a portfolio to graduate. In the first year of implementation, the focus was heavily on the technology. Every 9th grade English class was scheduled for a two hour lab session; at this time members of the Ideas Consulting staff (along with district technology staff) discussed the rationale behind the digital portfolios and the means by which student work would be uploaded. As the year progressed, students were given multiple opportunities to add work to their portfolios. Some teachers and students were comfortable enough at this point with the technology to work without any further assistance; some asked for additional support. The projects ranged from basic reports in Word and PowerPoint to digital video filmed and edited by the students. A major advantage of the portfolio design being used is that every aspect is
web based, allowing students and teachers to access, add to, and evaluate the information not only in school but also at home.

As the high school moves into the next year of implementation, the focus is less on the technology and more on the tasks students are asked to do. The school, as part of its accreditation process, has defined a set of academic, civic, and social expectations for its graduates. From there, teachers are defining a set of tasks where students can demonstrate these expectations against a schoolwide rubric. The types and nature of the assignments – as well as conversations about student expectations as the school prepares for its accreditation - is bringing about a new collaboration among teachers. As part of the professional development, teachers have worked together (often in departments) to design new tasks that more closely align to the subject area standards and schoolwide expectations.

Policy: Portfolios and “Graduation by Proficiency”

The development of the digital portfolio at the high school coincides with a major policy initiative. Like most states, Rhode Island has created a new set of regulations for high school graduation. Unlike most states, Rhode Island’s regulations do not focus on a standardized assessment. Instead, schools are expected to demonstrate “graduation by proficiency” (Rhode Island Department of Education 2004). In practical terms, this means that schools can no longer give diplomas based on “seat time”: the number of hours students spend in class. Beginning with the graduating class of 2008 (currently in their first year of high school), students are expected to provide evidence that they have the skills and knowledge expected of a graduate.

The state, with the Education Alliance at Brown University, has received a grant from the Bill and Melinda Gates Foundation to help schools with the graduation by proficiency work. Three networks have formed, focusing on three different approaches: the development of portfolios, the creation of “exhibitions” (typically, a capstone or senior project), and the creation of common tasks (often used to issue a Certificate of Initial Mastery). Each network consists of school practitioners (including teachers, technology coordinators, and principals), plus representatives from the state department of education. Together, this group is attempting to create guidelines for a portfolio system.

This work is just a few months old, but some key considerations have already come to the fore. A critical component of a portfolio policy is determining how the assessments can be made valid and reliable. It is possible to create such a system by having the state specify all of the allowable tasks; work such as the New Basics Rich Tasks effort in Queensland, Australia (State of Queensland 2001) represent significant steps forward in developing policies around performance-based assessments. In Rhode Island, the attempt is to create a policy that allows individual schools to generate at least some portion of the tasks for the portfolio.

Policies that specifically focus on portfolios began in the 1990’s in the American states of Vermont and Kentucky. Lusi (1997), in studying these policies, noted that conflicts can emerged between “using portfolios to improve the teaching and learning process versus using them as a mechanism for state accountability.” The conflict emerges from two of the goals for using portfolios: providing an opportunity for students to show their best work, yet creating a system that allows for comparability across schools and districts.

Following more recent examples of policies on performance-based assessments, such as those in Nebraska (2002) and British Columbia (2004), the Rhode Island network is attempting to find mechanisms to bring validity and reliability to the work in the schools. Linn and Baker (1996) note that tasks need to have “internal validity” (including issues such as content quality, curricular importance and cognitive complexity) as well as “external validity” (including issues such as the consequences for students and teachers, fairness, generalizability, and comparability). More generally, the public needs to be assured that the assessments being developed in the portfolio are reasonable, defendable measurements of the school’s learning goals.
The work of the network is to create a system where educators, working collaboratively across districts, determine what classroom assessments provide reasonable evidence that students have indeed met standards. One scenario is to have teachers submit tasks from their classrooms to a review committee (based in the school or in the district). This review committee can provide feedback to teachers about whether a task will yield student work that is appropriate for the portfolio. If done appropriately, such review committees can provide opportunities for professional development. Thus, as each teacher develops tasks appropriate to her class, she will also receive support from colleagues both in the school and from around the state.

The key for the state is to create opportunities for feedback and professional development. For many teachers – even if they embrace the notion of a portfolio – the creation of valid, reliable tasks is a new endeavor. In our district, and across the state, we expect to see teachers paying more attention to assessment issues. Already, some concern has emerged among faculty about taking time away from the curriculum to focus on assessments. However, when the faculty has the opportunity to design assessments that create new opportunities for performance, they find that the portfolio offers a way for students to show more about their skills and knowledge than ever before.

**Elementary School: Reflection at an Early Age**

Teachers in Bristol Warren elementary schools were already engaged in technology and assessment; using tools such as Wireless Generation’s mClass, teachers were using handheld devices to capture running records and uploading this information to a system.

However, these tools were providing just a part of the picture. Teachers and principals wanted to provide parents and students with a better sense of their progress over time. Thus, a group of five teachers began in the winter and spring of 2004 piloted the portfolio process.

For the portfolio, students were asked to be on camera while reading a passage from an appropriately-leveled book. Students then had the opportunity to look at themselves reading, and to reflect on their progress. Working with district technology staff and with Hilarie Davis of the Technology for Learning Consortium, students (and teachers) learned how to set goals for the next stage of their development.

Students quickly took to the task of working with the equipment; at the 4th grade level, teams of students were trained as videographers and soon took over the task of collecting the data. They learned how to upload the files through the web based interface, and the process of creating the portfolios soon became an independent task.

Just as importantly, students are becoming more independent in creating their reflections. The youngest students in grades 1 and 2 are determining how to set goals, and are thinking about what it means to get better at their work. This will serve them well as they move through the district and into the upper grades.

In the upcoming year, we expect to further connect the elementary work with the ongoing efforts to improve assessments. We are exploring how to link the artifacts in the portfolio with existing structures, such as the “personalized literacy plan” developed for students who are below grade level. The reflections that students are making about their own work should extend to the conversations adults have about the progress students are making overall.

**Going to Scale: Training is Key**

During the 2004-2005 school year we anticipate that the portfolio experience will be expanded to all 5th grades, some middle school grades and all 9th and 10th graders. Training is an issue of concern and will be addressed in a number of ways. Fall workshop sessions are planned for both elementary and middle school teachers and students; the district’s goal is to include the students in trainings whenever possible.
As the project expands, however, the training is changing in focus. As teachers and students become more familiar with the technology (and as the technology improves), the district can spend more time developing appropriate tasks and opportunities for reflection. Eventually, students will be working on their portfolios for all 12 years of schooling. They will be regularly examining the goals of education – as determined by the school and the state, but also as determined by their own needs. From this experience, students will practice the critical skills involved in becoming lifelong learners.

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PS7
Pourquoi et comment mettre en œuvre un projet de ePortfolio?
Considérer les modalités d’implémentation du Portfolio numérique à la formation universitaire des étudiants – futurs enseignants de FLE. Le cas du Département de Langue et de Littérature françaises de l’Université d’Athènes

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Résumé : Dans le cadre de cette intervention, nous envisagerons les modalités d’implémentation du Portfolio numérique au cours « Utilisation pédagogique des TIC en classe de langue ». Il sera question des raisons qui justifient le recours au système de e-portfolio (avantages du support numérique, compétences à faire développer chez les apprenants), du type de portfolio à adopter en fonction des besoins des étudiants hellènes, et enfin, des conditions à respecter lors de cette expérience.

Mots-clés : enseignement supérieur, étudiants hellènes, didactique du FLE, intégration des TICE


Nous allons nous référer, dans un premier temps, aux raisons qui justifient le recours au système de e-portfolio (avantages du support numérique, compétences à faire développer chez les apprenants). Ensuite, il sera question du type de portfolio à adopter en fonction des besoins des étudiants hellènes, et enfin, des conditions à respecter lors de cette expérience.

Pourquoi recourir au système de e-portfolio ?

Si nous avons décidé de recourir à un système de portfolio c’est parce que nous partageons entièrement la conception d’apprentissage sur laquelle il s’appuie, à savoir le fait qu’il constitue « un processus actif dont l’élève est le principal artisan » (Ministère de l’Education du Québec, 2002, 9). De plus, nous souscrivons la pédagogie sous-jacente au portfolio, « une pédagogie qui fait une large place à l’élève et à ses capacités d’apprendre (Ministère de l’Education du Québec, 2002, 17) et qui opte pour une approche par compétences (Ministère de l’Education du Québec, 2002, 10). Il s’agit bien là de fondements théoriques et de principes dont l’application aboutirait à une activation de nos étudiants : ils pourraient s’impliquer davantage dans leurs études, se responsabiliser et devenir autonomes.

En dehors des raisons purement pédagogiques, nous avons des raisons de croire que le portfolio «représente une solution intéressante pour la conservation des données et des informations à partir desquelles il est possible de suivre le cheminement de l’élève » (Ministère de l’Education du Québec, 2002, 11). Ils auraient ainsi l’occasion, non seulement, de progresser dans leurs études, mais aussi de garder une trace écrite des difficultés rencontrées pendant leurs études, ce qui leur permettrait de mieux guider leurs propres apprenants plus tard, en tant qu’enseignants.

Par ailleurs, opter pour le e-portfolio s’est avéré incontournable, étant donné que l’un des objectifs du cours retenu pour la réalisation de ce programme expérimental était le développement chez les étudiants d’une compétence technique / technologique ou d’une « compétence méthodologique quant aux TIC » (Ministère de l’Education du Québec, 2002, 13). Aussi avons-nous pensé que demander aux étudiants de remplir
le portfolio numérique contribuerait de manière significative au développement de cette compétence (utilisation des logiciels, dépôt / recherche d’un document à partir d’un ordinateur branché au réseau informatique). D’autant plus que « le portfolio numérique est accessible de partout plus aisément et plus commodément que le portfolio sur support traditionnel » (Ministère de l’Education du Québec, 2002, 6).

Type de portfolio à adopter

Vu les spécificités de notre public (étudiants en formation universitaire initiale qui focalise aussi bien à la préparation de leur insertion au marché du travail qu’à la maximisation de leurs compétences et performances en langue étrangère) et les déficiences retenues/relevées les dernières années pour ce qui est de la maîtrise de la langue (en l’occurrence le FLE), nous avons opté, dans cette première phase du programme expérimental, pour un portfolio qui remplisse des fonctions relevant du dossier d’apprentissage et du dossier de présentation (cf. L’infobourg, les types de portfolio).

Nous avons pensé que le dossier d’apprentissage renforcerait les acquis langagiers des étudiants du Département qui, quoique de niveau supérieur (ce qui devrait faire penser à une très bonne maîtrise de la langue/culture française), disposent relativement souvent d’un niveau inférieur qui correspond au niveau B2 du Conseil de l’Europe. Les étudiants-utilisateurs pourraient y ranger des travaux de toutes sortes et des réflexions sur ces travaux ainsi que des discussions et des échanges entre eux et avec l’enseignant, en fonction des compétences annoncées et retenues.

Quant au dossier de présentation, il faciliterait sans doute la meilleure insertion des étudiants au marché du travail les dotant d’un matériel faisant preuve de leurs savoir-faire susceptible d’être présenté dans le cadre d’une éventuelle demande d’embauche auprès du propriétaire d’une école ou d’un centre des langues privé.

Pour ce qui est du support du portfolio, nous avons décidé de commencer par un portfolio sur support « hybride », c’est-à-dire contenir des productions sur support numérique et des productions sur support papier (Ministère de l’Education du Québec, 2002, 13) et non pas par une approche toute numérique.

Quant au type du support numérique du portfolio, il nous semble prudent, pour le moment, de tirer profit de la mise en réseau des ordinateurs, de suivre un système de sauvegarde sur disquette / cd-rom et de loger le portfolio sur la page web du Département (http://www.uoa.gr) et la plate-forme de l’Université (http://eclass.uoa.gr).

Pour ne pas compliquer les tâches de nos étudiants pour lesquels le portfolio constituera une pratique, une expérience nouvelle, nous n’envisageons l’implantation du dossier d’évaluation que pour l’année prochaine.

Modalités d’implémentation du e-Portfolio

Pour l’implémentation du e-portfolio à notre cours, nous avons conçu trois projets traitant certains des thèmes du cours et dont la réalisation permettrait aux étudiants de remplir le portfolio d’apprentissage et le portfolio de présentation tout en atteignant les objectifs du cours.

Pendant le déroulement des projets, nous alternerons les modes d’enseignement (frontal, directif et interactif) et les modes de travail des étudiants (individuellement, par groupe et de manière collective).

Pour chacun de ses projets, nous allons présenter de manière succinte les compétences visées, les micro-projets ou les tâches prévu(e)s.

Premier projet : Utilisation des sites pédagogiques FLE à des fins didactiques

Compétences visées

- Compétence heuristique
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- Compétence d’analyse et de synthèse
- Compétence didactique
- Compétence méthodologique
- Compétence à exploiter les TIC/ compétence TIC (site web Laberge M.-Fr.)

**Micro-projets**

- se servir des moteurs de recherche pour repérer les sites pédagogiques FLE
- catégoriser les sites pédagogiques FLE retenus/trouvés
- concevoir un scénario pédagogique exploitant les ressources disponibles sur ces sites en fonction des niveaux du Portfolio européen des langues
  - choisir le type du scénario
  - déterminer les composantes de l’enseignement/apprentissage de la langue/culture
  - créer la fiche de planification du scénario (en fonction des composantes prédéterminées).

**Deuxième projet : Exploitation pédagogique du courrier électronique**

Il s’agit d’un recherche-action. Elle consiste à entreprendre, avec les étudiants, une enquête auprès des professeurs de FLE (enseignement secondaire public hellénique) sur l’utilisation du courrier électronique en classe de langue.

**Compétences visées**

- Compétence d’analyse et de synthèse
- Compétence méthodologique
- Compétence technique
- Compétence fonctionnelle
- Compétence à exploiter les TIC/ compétence TIC

**Tâches prévues**

- Elaboration du questionnaire
- Recueil des données par mail
- Dépouillement et analyse des données
- Rapport des résultats et affichage sur le site web du Département.

**Troisième projet : Elaboration de projets interdisciplinaires visant le développement de la prise de conscience interculturelle**

Dans le but de faire développer chez les étudiants des compétences transversales, nous avons considéré opportun de travailler conjointement avec des professeurs d’autres champs disciplinaires, ce qui, par ailleurs, répondrait aux besoins d’une conception holistique de leur formation universitaire.

- Etant donné que « faire développer le savoir socio-culturel / la prise de conscience interculturelle »
- mouvements des étudiants
- nationalisme et racisme

**Compétences visées :**

- Compétence discursive
- Compétence heuristique
- Compétence d’analyse et de synthèse
- Compétence méthodologique
- Compétence à exploiter les TIC/ compétence TIC
3.3.2. Micro-projets prévus

- rédaction d’un texte/document scientifique
- recherche documentaire (sur internet) sur les champs thématiques choisis
- analyse et regroupement des données
- construction du plan
- élaboration d’un projet de télécollaboration sur le champ thématique choisi pour le développement de la conscience interculturelle des apprenants de FLE.

- Conception
  Fixer des objectifs pédagogiques en fonction des programmes d’études et du public visé
  Préciser le type d’activités à réaliser
  Cerner le projet (but, nature des données à échanger, procédure à suivre pour rassembler les données, modalités d’échange des données, résultats attendus, modalités de partage des résultats)
  Déterminer les caractéristiques de ses partenaires de ses partenaires (nationalité, âge, degré scolaire)
  Spécifier la durée / le calendrier de réalisation du projet.

- Description
  Veiller à la clarté
  Veiller à la précision des tâches requises

Description du Portfolio proposé

Nous essaierons d’évoquer ici certaines caractéristiques du portfolio proposé et de son contenu.

Pour ce qui est de la fréquence de complétion du portfolio, elle sera hebdomadaire.

Quant à la structure du portfolio, elle sera au début prédéterminée. Or, l’étudiant, avec l’assistance de l’enseignant, aura la possibilité de la personnaliser.

Le type des travaux à insérer dans les dossiers serait également prédéterminé au début, sans toutefois exclure la possibilité de les voir s’enrichir en fonction des suggestions des étudiants.

Qu’en est-il du contenu du portfolio proposé ?

Etant donné qu’il remplit une fonction de portfolio d’apprentissage, il comprendra les éléments suivants :

- Des commentaires des étudiants sur les notes des cours (lecture active) : intérêt de la matière (goûts / préférences / intérêts personnels des étudiants), utilité pédagogique ou autre, points difficiles à comprendre.
- Des fiches de lectures créées par les étudiants concernant les articles / ouvrages consultés dans le cadre du cours.
- Des réflexions sur ces travaux de la part des étudiants :
  commentaires des étudiants sur leurs « motivations à réaliser des travaux tout en poursuivant l’atteinte des objectifs » (Ministère de l’Education du Québec, 2002, 17),
  les moyens mis en œuvre pour réaliser ces travaux / leurs méthodes de travail,
  les difficultés rencontrées pour la réalisation de ces travaux, les solutions trouvées, leurs points forts / leurs faiblesses,
« les pas à faire prochainement en ce qui concerne ses travaux en fonction de la compétence à développer » (Ministère de l’Education du Québec, 2002, 14)

- de leurs enseignants.

Par ailleurs, pour répondre aux exigences d’un portfolio de présentation, les étudiants pourront y inclure séparément leurs productions finales, après avoir soigné la présentation et la mise en page. Ces productions seront gravées sur cd-rom qu’ils vont garder et les meilleures d’entre elles seront affichées sur le site web du Département.

**Conditions à remplir pour une implémentation réussie du ePortfolio dans l’enseignement universitaire**

Comme pour tout projet, certaines conditions doivent être remplies pour voir réussir cette tentative. Il s’agit de conditions

d’ordre pédagogique :
- promouvoir une pédagogie qui intègre l’utilisation du portfolio, à savoir
  - créer « un climat de confiance et d’empathie entre les acteurs […] qui ont accès au portfolio » (Le portfolio dans l’apprentissage, 5) ;


d’ordre méthodologique :
- choisir un support de portfolio conforme aux ressources humaines, matérielles et technologiques (Ministère de l’Education du Québec, 2002, 21) ;
- intégrer de manière « méthodique et graduelle des différents types de portfolios (apprentissage, présentation, évaluation) sur support numérique » (Ministère de l’Education du Québec, 2002, 23)


d’ordre organisationnel :
- avoir un nombre d’ordinateurs suffisant, reliés en réseau, ayant accès sur Internet ;
- apprendre aux étudiants à respecter le droit d’auteur dans l’usage qu’ils font de documents trouvés sur internet (voir les références relatives dans la bibliographie, le fichier « internet for teachers »).
- respecter les lois relatives à la protection des renseignements personnels.

Nous avons conscience du travail requis pour la réalisation de ce projet tant de notre part que de la part des étudiants. Dans une première phase, le portfolio constituera pour nous
- un outil d’enseignement et
- un « dispositif d’apprentissage », car il aidera l’étudiant à « assumer ses apprentissages et son suivi » (Ministère de l’Education du Québec, 2002, 6)) ;

Nous espérons également avoir la possibilité de l’utiliser dans une deuxième phase en tant qu’outil / moyen d’évaluation ce qui lui accordera la fonction d’un « instrument au service de l’enseignant, qui lui sert à faire l’évaluation » (Ministère de l’Education du Québec, 2002, 6) des étudiants.


Cette possibilité ouvre, à notre avis, des perspectives particulièrement intéressantes tant pour les étudiants que pour le personnel enseignant de notre Département. Pour ce qui est des premiers, nous considérons que leur familiarisation avec le portfolio accroîtra les possibilités d’avoir, dans l’avenir, des enseignants / utilisateurs avertis du portfolio en classe de langue. Les enseignants du Département parviendraient à
mieux suivre leurs étudiants, à se rendre compte de leur niveau afin d’y adapter le contenu de leurs cours.

**Bibliographie consultée**


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Services d'un ePortfolio interagissant au sein de dispositifs de formation professionnelle selon l'approche par compétences

Alain SEMETEYS 1 & Nacer TAGUEMOUNT 2

Abstract: Integrated e-learning system, specifically designed to upgrade the knowledge level produced and shared by the learners, within the framework of a numeric space, for the management of aptitudes and Knowledge, either on a one-to-one or a group basis.

Résumé : Cette communication concerne la problématique de la recherche et développement, récemment engagée par Numedia en partenariat avec le CRIP5 - Centre de recherche en Informatique de Paris V, en matière de dispositifs de formation professionnelle architecturés autour de trois sous-ensembles de « webservices ressources » et de processus associés en interaction que sont : le management des Connaissances (Knowledge Management), la gestion des compétences et la « E-Formation – action ».

Ce projet s'inscrit dans le contexte d'une première version opérationnelle de plate-forme, de E-formation selon l'approche par compétences, développée en étroite collaboration avec l'ISM (Institut Supérieur des Métiers).

Après une clarification des concepts de base, d'information, de connaissances, de co-développement des compétences et de formation-action selon l'approche par compétences, la réflexion porte sur le positionnement stratégique d'un E-portfolio « de seconde génération », c'est à dire intégrant notamment le concept d'un « workflow de la montée en compétence individuelle et collective », dans le temps et l'espace, des différents acteurs des dispositifs cibles.

Mots clés : E-learning, compétences, connaissances, ePortfolio , Knowledge Management

Summary: This presentation deals with a Research and Development process system which has recently been introduced and developed by NUMEDIA company and its partner, the CRIP 5 - the Data Processing Research Center of PARIS V, as a professional training system set up around 3 sub-units of " webservices ressources " and of interactive combined processes such as Knowledge Management, Competency Management and e-training.

This project is part of a first operational platform of e-training, according to the Competency Chart Pattern developed in close partnership with the ISM (Institut Supérieur des Métiers).

After a clarification of the basic concepts of information, of knowledge, of co-development of aptitudes and of action-training according to the competency chart pattern, our concern is about the need for a strategic positioning for a "second generation" e-portfolio that is to say which can integrate, among other concepts and parameters, that of a " workflow ", on an individual or group basis, in time and space, of the different actors of the targeted purposes.

KeyWords : E-learning, competences, ePortfolio , Knowledge Management

Contexte et historique du projet de R&D

La formation professionnelle et/ou continue représente un enjeu économique, social et culturel essentiel, compte-tenu des évolutions technologiques rapides qui imposent aux travailleurs de se former tout au long de leur vie. Comme l’accent mis

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par le programme européen IST (Information Society Technology) en atteste, ces formations doivent s’appuyer sur les Technologies de l’Information et de la Communication pour permettre des lieux et des temps différents, adaptés aux besoins et aux nécessités des entreprises et des personnes. De plus, le grand nombre de personnes concernées (par exemple pour la VAE) impose l’emploi massif de l’outil informatique.

Dans ce contexte socioprofessionnel, l’approche par compétences est devenue le cadre de référence universellement reconnu. Cette approche est notamment basée sur les concepts d’objectifs, de compétence et de capacité, que l’on peut, dans une première présentation de notre perception, résumer ainsi [VasaSem]:

**Objectif** : Ensemble de compétences attendues d’une formation décrite de manière opérationnelle, comportant des critères permettant d’évaluer le degré de maîtrise de la compétence.

**Compétence** : Aptitude à mettre en œuvre un ensemble organisé de capacités permettant d’accomplir un certain nombre de tâches, de produire une performance. La compétence est une combinaison de savoir, savoir-faire et savoir-être (comporte des aspects cognitifs, psychomoteurs et affectifs);

**Capacité** : Pouvoir d’accomplir ou de produire un comportement en rapport avec une activité ou une tâche.

L’approche par compétences introduit l’univers de la vie réelle dans la formation. En d’autres termes, la référence devient l’activité proprement dite et non le savoir. **Elle centre la formation sur ce que la personne doit pouvoir faire effectivement et non uniquement sur la connaissance de ce qu’elle doit faire.**

Le savoir n’est qu’un moyen de l’activité et non une fin. L’approche par compétences est un instrument (et c’est essentiel dans le domaine de la formation professionnelle) de l’articulation entre l’univers de la profession et l’univers de la formation.


Architecture (simplifiée) de la plate-forme développée :

Les contenus modulaires (dont la production fait strictement appel au standard HTML et à la technologie Flash de Macromédia) sont indépendants de la plate-forme
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(développée en PHP et valorisant le noyau open source Ganesha : www.anemalab.org/ganesha/).

De ce fait, les contenus modulaires de formation sont valorisables, à coût marginal, sur CD-ROM. L'apprentissage peut s'effectuer en mode déconnecté (modalité « Off Line » schématisée ci-dessus). À cet effet, l’architecture de la plate-forme intègre un « tunnel de communication » (une passerelle de communication utilisant la technologie « Flash remouting » de Macromédia). Les modules de formation gérés par cette première version sont dénommés « modules standards ». Dans un module standard les scores sont enregistrés si et seulement si les tests d’entrée et de sortie ont été effectués. Nous avons depuis établi une typologie plus fine des modules et défini le concept de « module hybride » :

Un « module hybride » intègre une « séquence externe » pouvant consister par exemple à un regroupement en présenciel ou par « vidéochat » d’un groupe d’apprenants. Une séquence externe peut également intégrer une passerelle de communication avec des sous-systèmes, notamment avec un ePortfolio compétences.

Nous appelons « composant » 1 un sous-ensemble fonctionnel, intégré dans le « corps du module », présentant un caractère homogène et cohérent. La typologie est la suivante :

Composant « Introduction » : Ce composant est systématiquement présent dans le corps du module. L’introduction est destinée à motiver l’apprenant, à lier ce qui va être appris avec l’acquis antérieur, à faire percevoir le but à atteindre et à esquisser le chemin qui sera suivi.

Composant « situations d’apprentissage » : Il s’agit d’un composant englobant un contenu multimédia interactif, une séquence logique d’autoformation du module mis en ligne. Le parcours peut commencer par une séquence de redécouverte, suivie de la communication précise de l’information à transmettre ou de l’installation du comportement à faire acquérir. Ces situations incluent des exemples, des contre-exemples, des cas sur lesquels l’apprenant exerce de nombreuses activités qui forment une progression centrée sur la maîtrise complète de l’objectif. À l’occasion de ces activités, l’apprenant a la possibilité de contrôler ses progrès et en cas de difficultés ou d’erreurs, peut être orienté vers des rattrapages prévus dans le module ou gérés par le formateur.

1 Termes induisant une programmation informatique orientée objet du concept de « sous-module » dans la terminologie initiale, de l’organisation modulaire des contenus de formation formalisée par Louis D’Hainault.
Composant « Séquence Externe » : Un composant externe renvoie à une séquence d’activités mettant en œuvre des ressources autres que des séquences multimédia en ligne. Le déroulement d’une séquence externe peut consister par exemple en une interruption momentanée de « l’apprentissage en ligne » pour participer à un regroupement présenciel, effectuer un stage en entreprise, la correction d’un exercice conditionnant la poursuite du parcours de formation, etc …

Une fois cette séquence externe terminée (et validée par le tuteur de la formation) l’apprenant peut poursuivre le parcours du corps du module. Notons que l’organisation modulaire de formation s’appuie sur des concepts et principes pédagogiques bien formalisés mais n’impose pas une mise en œuvre rigide. Une séquence externe (un stage entreprise par exemple) peut faire l’objet d’un module à part entière ou être intégrée en tant que composant dans le corps d’un module de formation globale (alliant théorie et mise en pratique). C’est l’auteur de la formation qui spécifie le programme type de formation opérationnelle (décrit le cas échéant dans le « Référentiel de compétences et des modules de formation associée » présenté plus loin ). Le concepteur multimédia intègre ces directives dans la définition et la réalisation du produit.

Une « assistance tuteur » peut-être vue comme un module externe. Elle peut s’opérer par regroupement physique, par Webcam, par téléphone, par fax…

Composant « Exercices » : Ce type de composant apparaît explicitement lorsque les exercices, les études de cas (effectués individuellement ou en groupe) nécessitent une correction par un formateur et dont les résultats conditionnent la suite du parcours de formation. Dans le cas contraire les exercices sont intégrés dans le corps du module dans des composants « situations d’apprentissage » (avec en général une auto-correction et donc un accès à un corrigé également intégré au corps du module de formation). Là aussi, c’est le concepteur de la formation qui décide de la structuration des contenus.

Le descriptif d’un composant dans le référentiel des « compétences et de la formation modulaire associée » comporte typiquement des conseils, des directives que nous convenons d’appeler « pré-conditions » et « post-conditions ».

Par exemple pour un composant de type séquence externe « Mise en œuvre pratique en entreprise » une post-condition pourrait être : « Poursuite de la formation après bilan par le chef d’entreprise en concertation avec le formateur »

Les pré-tests et les post-tests peuvent généralement se traduire par une affectation de tâches (mesurables) prises en charge par un ou plusieurs acteurs du dispositif de formation (tuteur en entreprise, formateur, administrateur, …) dont il faut s’assurer de la bonne exécution (voir ci dessous (3)).

(2) « L’éditeur de Référentiels de Compétences et de modules associés de formation » est un outil autonome (fonctionnellement limité dans cette première implémentation) mais qui préfigure le développement d’un « environnement intégré de génie logiciel de formation selon l’approche par compétences » visant notamment à :

garantir une certaine traçabilité (une assurance qualité) dans le temps et l’espace du cycle de vie (spécification des objectifs, … validation des acquisitions, capitalisation dans un e-portfolio compétences…) du processus de développement des compétences individuelles et collectives

automatiser la production des composants (voir ci-dessous) constitutifs des modules de formation et à leur indexation par des méta-données.

Bien entendu, ces développements s’appuieront sur les standards actuels (AICC/SCORM, LOM …) et émergents (notamment en matière d’E-portfolio compétences) des méta-données des objets « Apprentissage », « Compétences », et « Connaissances ».

Cette première version d’Editeur est un outil de documentation (de spécification) des « Formations modulaires selon l’approche par compétences ». Il permet de décrire des compétences et de leur associer les spécifications d’unités modulaires de
formation visant à leur acquisition (formation de base et/ou perfectionnement). Les structures décrites sont mémorisées en XML et ne posent pas à priori de problème majeur de faisabilité pour une intégration dans un ou plusieurs « profils d’application » de métadonnées descriptives interopérables avec les standards. Par profil d’application nous entendons l’acceptation québécoise du terme [Creuq], p 133 : « un profil d’application et ses directives insistent sur l’amélioration et l’explication plutôt que sur la personnalisation ou la modification d’une norme et cherchent à répondre aux besoins d’une communauté ».

Structure hiérarchique des données gérées actuellement par l’Editeur de référentiels des Compétences :

Le schéma suivant illustre un exemple de description, celui du référentiel BCCEA (Brevet de collaborateur de chef d’entreprise artisanale) décliné en « domaines de compétences, compétences et unités modulaires de formation »:

Un tel référentiel peut comporter de un (au moins un) à plusieurs domaines de compétences (par exemple le domaine « Gestion de l’entreprise » représenté ci-dessus). Un domaine de compétences regroupe un ensemble logique de compétences.

Par exemple, à la compétence « COMMUNICATION », du domaine « Gestion de l’entreprise » est associée deux unités modulaires de formation (« les fondements de la communication » et «les situations relationnelles »). Chaque unité modulaire comporte au moins un module de formation.
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Exemple : Unité modulaire de formation « Les fondements de la communication » comporte 4 modules de formation :

- Module de formation 1 : Le schéma de base de la communication
- Module de formation 2 : Les ressorts de la communication
- Module de formation 3 : Les situations types de communication
- Module de formation 4 : L’environnement matériel des échanges

Cette première version de l’Editeur est un outil de spécification purement textuel. A terme l’objectif est de le faire évoluer vers un environnement de génie logiciel pédagogique interagissant avec un système ouvert intégrateur de WebServices liés au management des Connaissances et des Compétences professionnelles individuelles et collectives.

(3) Le « gestionnaire de tâches » est également un outil autonome (dans cette première implémentation de la plate-forme de formation) destiné aux utilisateurs dotés du « profil intervenant » (formateur, tuteur, responsable de formation, …). L’outil permet aux « intervenants » (aux « acteurs du dispositif de formation ») de créer simplement et de partager des « séquences de tâches » indexées dans le cas présent par 2 attributs : un type de séquence de tâches (pédagogique, administratif, …) et une étendue (concerne un individu, ou tout un groupe d’apprentis).

Ces attributs élémentaires et la structure de données actuellement gérée par l’éditeur de référentiels de compétences constituent les premiers éléments embryonnaires d’un ensemble structuré, en cours de conception, de méta-données descriptives des différents niveaux du sur-ensemble cible, objet de notre R&D :

« L’intégration de dispositifs E-Learning, valorisant les connaissances produites et partagées par les apprenants, dans un espace numérique de management, individuel et collectif, des compétences et des connaissances »

L’architecture logique de cet espace numérique comporte 3 niveaux :

Dans le contexte de la mondialisation galopante des échanges, ponctuée par l’alternance de périodes d’embellies et de crises économiques, il devient de plus en plus inconcevable d’appréhender la formation professionnelle sans anticipations suffisamment maîtrisées et sans la considérer comme un investissement rentable susceptible d’apporter de manière réactive des réponses pertinentes aux besoins à venir. La gestion des différentes classes d’âge devient un véritable problème pour
Il – Questionnement préalable et premiers éléments de la problématique de cette recherche

Les entreprises confrontées à la prévision de la pénurie de jeunes actifs qualifiés, de fidélisation des salariés. C’est dans ce contexte que nous positionnons en particulier la GEPC, la VAE comme des applicatifs « haut niveau » dans cet « espace numérique de management » s’appuyant sur un ensemble de « Webservices » et de ressources partagées.

II – Questionnement préalable et premiers éléments de la problématique de cette recherche

L'exploitation (diffusion notamment par l’ISM sous la marque déposée I-Formation dans le réseau des chambres de métiers) de cette première réalisation opérationnelle de la « Plate-forme de formation selon l’approche par compétences » et les remontées du terrain alimentent actuellement notre réflexion pour la conceptualisation d’une interaction plus riche d’un « dispositif de formation mixte (présenciel-distantiel) » et d’individualisation des parcours », avec un certain nombre de sous-systèmes, notamment avec un « ePortfolio compétences » dynamique, c’est à dire, intégrant des processus interactifs non seulement de présentation sur interrogation multicritères mais aussi de validation et de suivi des compétences en cours d’acquisition.

Ces travaux sont sous-tendus par un premier questionnement préalable concernant les interactions dans l’espace et le temps du management des connaissances et des compétences. La Problématique de ce projet de R&D, mené par Nacer Taguemount, ingénieur à Numédia et doctorant du CRIP5 (http://www.math-info.univ-paris5.fr/crip5/) peut s’inscrire dans le triptyque de référence suivant :

**Formation professionnelle et pédagogie des adultes**

La formation professionnelle que l’on s’accorde à qualifier de « tout au long de la vie » constitue notre champ d’investigation. L’humain qui respire « tout au long de sa vie » ne va pas « en respiration », il respire ! Dans ce nouveau contexte de formation tout au long de la vie, que signifie aujourd’hui « aller en formation » ? Le concept de formation (à ne pas confondre avec celui d’éducation concernant notamment l’acquisition des savoirs dits fondamentaux) dans le contexte des activités professionnelles d’individus confrontés en permanence à la question de leur employabilité, devient réducteur. Est-il amené à disparaître, mais au profit de quel autre paradigme ? Nous sommes tentés de proposer celui de « développement des compétences ». Nous n’allons plus en formation mais en « développement de compétences » !

L’ingénierie de formation et l’ingénierie pédagogique sont de nature différente mais complémentaire. L’ingénierie de formation concerne la structuration des dispositifs de formation et notamment l’individualisation des parcours. L’ingénierie pédagogique concerne la conception des modules de formations, la structuration des contenus et leur production.
Sandra Bellier [Bellier] met en avant que l’appropriation (question clé de toute pédagogie) relève de la convergence de ces 2 démarches d’ingénierie, celle concernant le dispositif et celle qui traite des situations spécifiques d’apprentissage. Les quatre axes suivants, retenus par ce même auteur, comme principes méthodologiques majeurs pour constituer le socle de la pédagogie pour adultes nous semblent également pertinents :

«

le premier concerne les acteurs et le changement fondamental de position entre un apprenant acteur de sa formation et un « formateur ressource » ;

deuxièmement l’importance de l’action dans les démarches pédagogiques que nous préconisons ;

troisièmement concerne la métacognition et le fait de permettre aux apprenants de comprendre leur processus de formation ;

le quatrième concerne l’inscription de la formation dans le temps et la notion de « processus de formation » pour construire l’ingénierie.

»

Ces principes directeurs guident notre démarche conceptuelle pour la définition d’un dispositif E-learning privilégiant, mais de manière non exclusive, une approche de formation-action par compétences et construit sur le partage des connaissances apportées par les apprenants.

L’approche « Traditionnelle » de formation peut être considérée comme une démarche « top down » avec comme point d’entrée les « experts du domaine » qui apportent « leurs connaissances » (1). L’approche de formation par compétences et « Mutualisation des connaissances » (2) peut être appréhendée comme une démarche de formation-action « Bottom Up » valorisant une base de connaissances et de compétences co-produites par les apprenants.
Le management des connaissances (appelé parfois également « gestion des connaissances ») ne se réfère pas toujours strictement au champ de la connaissance (en assimilant cette dernière, par exemple, avec leur support : documents, applications informatiques …). Les concepts de connaissances et de compétences font également l’objet de confusions permanentes. Nous reproduisons ci-dessous le schéma proposé par Claire Beyou [Beyou] qui synthétise l’articulation ascendante entre les différents concepts de base (données – informations-connaissances-compétences) :

Une donnée (typiquement stockée dans une Base de Données) n’a pas de sens en soi. Le système d’information de l’entreprise mémorise, structure et transforme les données de base en informations utiles pour l’utilisateur mais n’est producteur des connaissances qui sont susceptibles de permettre de trouver une solution à un problème.

Les théories constructivistes appréhendent les connaissances comme des constructions individuelles qui s’élaborent dans l’univers du mental. : [Harris] , « …La connaissance résulte du travail de transformation que l’individu exerce sur l’information reçue. La connaissance est privée alors que l’information est publique. La connaissance ne peut-être communiquée ; seule l’information peut-être partagée. A chaque tentative de partage de la connaissance, cela se traduit en information … »

La plupart des systèmes actuels de management des connaissances attestent d’une vision séquentielle des processus de transformation de l’information en connaissance. Une connaissance peut se traduire dans un contexte donné par l’émergence d’une compétence qui à son tour est susceptible d’être un catalyseur de production dans un contexte identique ou différent de connaissances consolidées ou nouvelles.

Dans le domaine du KM, les connaissances sont le plus souvent distinguées selon une typologie basée sur leur degré d’explicitation (explicites, tacites, implicites).

Si les connaissances donnent du sens à l’information transmise, parler de compétences c’est entrer dans le domaine de l’action. Si la connaissance peut être décontextualisée , la compétence ne peut-être abordée que dans un contexte donné nous confortant dans les définitions que nous avons retenues au début de cet article.

Mais se pose alors le problème de la décontextualisation de la compétence acquise (évaluée, au sein d’un dispositif de formation, « à chaud » dans un contexte circonscrit à la résolution de problèmes-supports de la formation et nécessairement réducteurs), pour produire la performance escomptée dans d’autres situations professionnelles du domaine concerné de compétences, non prévues ou non prévisibles. Notons cependant que la compétence acquise à un instant donné, répond à un besoin plus ou moins immédiat pour le développement de l’activité de l’entreprise. Cette compétence est amenée à s’enrichir dynamiquement de compétences complémentaires. De plus, la validation d’une compétence individuelle

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Données – information – connaissances – compétences -ePortfolio
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interfère avec celles acquises par d'autres acteurs de l'environnement socio-économique.

Un des enjeux de la maîtrise de cette complexité concerne une meilleure intégration de dispositifs dynamiques et réactifs de formation à distance selon l'approche de formation par les compétences dans un environnement plus large, qui est celui de la GPEC (Gestion Prévisionnelle des Emplois et des Compétences).

Nous positionnons le concept de « dispositif de formation-action valorisant les connaissances produites et partagées par les apprenants » dans le contexte d’une stratégie de co-développement individuel et collectif des compétences. Nous émettons alors l’hypothèse que cette approche de formation est d’une part, efficace et efficiente et du fait même de son adéquation à la pédagogie des adultes. D’autre part, du partage interactif de corpus diversifiés des connaissances apportées par les apprenants peut résulter une connaissance unifiée cohérente et enrichie (qui ne se confine pas à une simple addition des connaissances individuelles) et susceptible dans le processus de capitalisation en compétences acquises d’en atténuer leur contextualisation.

Un ePortfolio est un porte-folio (portfolio) qui s’appuie sur des médias et des services électroniques. Son contenu est multimédia (texte et HTML, graphique, mais aussi, fichiers audio, clips vidéo, …). Une difficulté majeure est d’en délimiter le périmètre fonctionnel. Dans le cadre de notre projet de recherche il s’agit de toute évidence d’un concept intégrateur allant bien au-delà de son aspect premier, de base de données, stockant des informations personnelles qui décrit, documentent et illustrent les résultats des travaux obtenus par une personne au cours de son apprentissage, de sa carrière ou de sa vie sociale. Un ePortfolio «de seconde génération » comme illustré sur les figures précédentes est susceptible d’intégrer (en tant que « ressource partagée » et/ou « WebService spécialisé » un certain nombre de processus dédiés, notamment de gestion de projet et de « workflow » pour une plus grande maîtrise du cycle de vie du développement prévisionnel des compétences individuelles et collectives.

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PUZZLE

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Le projet:

Mise en place, expérimentation et transfert d'un dispositif de formation à distance destiné à des médiateurs qui doivent faciliter à leurs publics (salariés PME, jeunes ou adultes en insertion sociale ou professionnelle):

- l'accès à la Société de l'information;
- la compréhension et le décryptage des informations recueillies;
- la mise en place d'une dynamique d'autoformation.

Ce dispositif utilise les NTIC (plate-forme coopérative) et privilégie une démarche de formation-action (les médiateurs accompagnent les projets de leurs publics respectifs en étant eux-mêmes accompagnés par des tuteurs)

La pratique de cette démarche permettra aux médiateurs qui le souhaitent d'engager une démarche de validation des compétences acquises au travers de cet accompagnement.

Deux objectifs

une fonction ressources

Mise en ligne d'un centre de ressources constitué de ressources pré-existantes et d'outils et de méthodes communiquées par la communauté des médiateurs

une fonction formative

Les médiateurs complètent ou renforcent leurs compétences tout au long de l'accompagnement de leurs publics

Ces compétences se regroupent en cinq grands champs:E-Communication; Diagnostic / Formalisation / Analyse / Synthèse; Communication / Relation; Prise de décision; Accompagnement de projets individuels.

Le portfolio électronique du médiateur Puzzle

Chaque médiateur, tout au long du parcours Puzzle, aidé par son tuteur, formalise son expérience, rassemble des preuves dans son portfolio personnel et peut, s'il le souhaite, engager une démarche de validation des acquis obtenus au travers de cette expérience. Le portfolio comprend trois parties:

- une partie A dite « phase préparatoire » : son objectif est d'aboutir au contrat pédagogique. Cette partie comprend un certain nombre de grilles permettant au médiateur de: - prendre connaissance des compétences que Puzzle se propose de développer; - être reconnu dans sa démarche par son institution; - préciser ses motivations; - formaliser un Curriculum Vitae ciblé sur le projet; - caractériser l'expérience acquise; - effectuer un autodiagnostic.
une partie B dite « phase de formation » : le médiateur y trouve un dossier-type de suivi. C'est son journal de bord personnel tout au long de son utilisation du site www.puzzle-online.org. A l'issue de chacun des sept modules concernant l'accompagnement de son propre public et de manière itérative, il effectue une analyse de sa pratique, formalise l'élément de compétence qu'il estime avoir développé et rassemble les « preuves » (comptes-rendus, travaux du public,...). Il décrit la ou les méthodes(s) pédagogique(s) utilisées(s), les effets et résultats sur son public. Il fait évoluer son autodiagnostic initial.

Une partie C dite « phase de bilan » dont l'objectif est de faciliter un travail global de synthèse. Le médiateur analyse son dossier de suivi et formalise dans une grille la synthèse des compétences développées, il analyse également l'ensemble du dispositif de formation Puzzle. Il effectue enfin un bilan pédagogique avec son tuteur.

Le médiateur place l'ensemble des travaux réalisés à l'occasion de son travail de portfolio dans sa salle privée du site www.puzzle-online.org où seul son tuteur peut les consulter.
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Impact of ePortfolio policies on organisations
Side Effects and Benefits of Digital Portfolios: The Culture Factor

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Abstract: Digital portfolios can be a powerful tool in transforming schools. In examining portfolios from three environments (a fourth grade classroom writing portfolio; a college portfolio for student teachers, and a high school graduation portfolio), the authors look at the side effects, and how institutional cultures are changed to become more collaborative and reflective communities.

Introduction

As digital portfolios take hold in more and more schools and colleges, we are beginning to see some common patterns. Often, educators begin the implementation of digital portfolios focusing on the technology. The attractiveness of seeing student work online gets schools excited about portfolios, and schools that commit to a portfolio project quickly begin work on acquiring software and training personnel on how to use multimedia tools. Soon, however, the novelty of the technology wears off, and the organization begins to face issues that weren’t in the initial plan. The “side effects” of digital portfolios force organizations to re-think how they approach a variety of issues. When student work goes into an online space, the relationships among students, teachers, administrators and parents can be affected in profound ways.

Outlined in this paper are the experiences of three unique portfolio implementation projects. Through the experiences of the project coordinators we will examine the question, “What else has to change?” While the authors’ experiences are from elementary, secondary, and university environments, there are more similarities than differences. The process of organizational change is never easy, but in examining the ways that portfolios have been implemented in different settings, we can see the common elements.

School Culture

Digital portfolios will only have a lasting effect when they are accompanied by other elements of organizational reform. The early research on digital portfolios at the Coalition of Essential Schools (Niguidula 1997) indicates that schools need to address a set of “essential questions” to make sure that the portfolios are more than a high-tech gimmick. These questions deal with issues ranging from a school’s vision and purpose to issues of assessment and logistics:

Vision: What should a student know and be able to do?
Purpose: Why are we collecting student work? Who is our audience?
Assessment: How can students demonstrate the school’s vision? How do we know what’s good?
Technology: What systems will we need? Who will support it?
Logistics: Who will select the work? Who will digitize the work? When will this happen?
Culture: What makes a portfolio valued and valuable?

The hardest of the essential questions deals with changing the school culture – “What makes a portfolio valued and valuable?” (Davis 2002). Portfolios, like many innovations, fail when they are counter cultural or culture blind. They become unwelcome, burdensome add-ons – assessment for someone else, assignments and endless collecting of work without an audience or purpose. For portfolios to be successful, they must first and foremost be embedded in what teachers and students
Portfolios need to answer a question, fill a need or solve a problem, or the portfolios themselves will become the problem.

Through our work, we have identified several key questions that determine if a school’s culture is conducive to adopting portfolios:

**What in the pre-existing culture is “portfolio friendly?”**

For portfolios to succeed, the culture must be open to change. If status quo is favored over consideration of new and different ideas, then the time for portfolios is not yet here.

Schools need a technology infrastructure; that is, the students must have regular access to computers, video and online resources. Increasingly, students enter schools and universities with technology expertise, but it is not always supported by the tools they need to be productive with technology.

**What does the school value that would invite the use of portfolios?**

Does the school want to focus on student achievement? If so, portfolios provide a mechanism to look closely at what students know, how they know what they know, and how they think about their learning.

Are the teachers curious about, and interested in, reducing lecture and increasing conversation and reflection? Schools with a strong advisory system, an emphasis on inquiry, cooperative learning or paper portfolios find that portfolios will support and enrich these initiatives.

**What cultural elements would need to be developed for portfolios to thrive?**

Schools may need to prepare the ground before planting the portfolio seed. Through existing conversations on curriculum, professional development, or policy, schools can begin to emphasize the use of exhibitions and emphasize reflection. For example, curriculum committees can identify “portfolio contributions.” Professional development for teachers can emphasize reflection, collaboration and audience. Policy can require “exhibitions” in addition to traditional testing and coursework. Performance based assessments can live in a portfolio. Parents, potential employers, advisors and mentors can be audiences for the portfolio.

**What “side effects” would be welcomed by the institution?**

While there is a minimum amount of commitment, resources and understanding needed to begin portfolios, we find that a few strong elements are sufficient for the idea to take hold. With nurturing for reflection, weeding out misconceptions, and lots of attention to the early successes, schools find positive side effects in most areas.

The portfolio has a unique focusing effect for students, teachers and policy makers. It is so close to the students that it does not suffer from being “only an idea.” Its very structure promotes thinking and talking about the by-products of learning, so it cannot be dismissed as an “add-on.” As teachers clarify what is worth thinking about, what is required improves. As they actually see what students are learning (and not learning) they become more focused on instruction. Not surprisingly, students also see what they are learning and become more focused on learning.

Perhaps the important thing is to watch the developing seed closely and to nourish it so it can flourish. As the culture is nudged to support the portfolio, it will shift; sometimes profoundly, sometimes quickly, but sometimes slowly. Those who would build a portfolio culture need to watch the accommodations made and make note of them for the entire learning community. Encouraging even small changes can create ripple effects.
Observations from Successful Implementations: Three Stories

To see how culture and portfolio interact, we offer three case studies of portfolios. We have found overlap in our work because of noticing how the culture - its values and systems – either support or thwart the use of portfolios. Each story addresses the essential questions outlined above. (The stories were contributed as follows: “A Classroom Writing Portfolio” by Hilarie Davis; “A College Portfolio for Student Teachers” by Gail Ring and “A High School Graduation Portfolio” by David Niguidula.)

A Classroom Writing Portfolio

Let’s start with Maureen, an elementary school teacher. Maureen wondered why her 4th graders didn’t use what she was teaching them about writing to make their stories better. She was thrilled with what she was learning about how to teach writing. Her students were engaged. They seemed to be developing ways to “hook” the reader in the first few lines, but they weren’t sufficiently interested to edit their writing. So when Maureen had a chance to have her students have writing portfolios she thought maybe it would help. With four computers in her classroom and a lab down the hall, she thought it could work. With 29 students in the classroom and no less than 10 students with agendas other than learning, she hoped the collecting and reflecting with cameras, scanners, audio recorders and a web-based portfolio would be active enough to keep them on task.

She was right. Well, sort of. For the first few weeks, her strong voice, whole group activities and “now go write about a present for Santa” ran headlong into the noisy student-to-student talk of peer writing groups and the writing process. Since they were assigned a topic, some students couldn’t get interested enough to write, much less revise. They were very excited by the technology. So much so, in fact, it seemed as though they just finished their prewriting webs of ideas so they could scan it in. They only wrote a draft so they could be filmed conferencing with a partner. They only revised to get another on-camera interview.

These media-savvy kids had all the strut and none of the substance. At first it seemed as though the technology might not get them to take their writing more seriously, but only be a distraction. But Maureen hung in there. First, she let go of the “Today you need to finish your idea map and tomorrow you will write your first draft” because she saw how some students took a long time with their maps, but then the ideas just flowed into paragraphs. Next, the, “Today our topic is ‘how we like our bunny’” morphed into, “You might want to write something about our bunny, or something else going on in our classroom.” Finally, the assigned writing groups and peer conferencing became on-demand rather than scheduled. “They were ready at all different times to do their peer conferences, and they wanted to do them with someone who could help them.” The conferences had become public since the students needed, “quiet on the set” to get good sound quality so the students quickly learned who was good at what. They chose their peer editors based on that knowledge.

By the third week, the technology was taking second fiddle to the writing process. Students wanted to be their best and show how their pieces were getting better. Students were talking like writers. As Gina said, “I think this is going to be a pretty good story.” The technology had been exciting, but now the writing was more exciting. Putting pieces in a digital portfolio had been the impetus for changing how writing was taught and learned in this fourth grade classroom.

Maureen was not attached to her approach; she was attached to results. Her professional development was encouraging her to shift from a highly structured, whole group approach to treating students like the readers and writers they are. Until the digital portfolio, she couldn’t see how some of her methods were getting in the way of that. Within the process of collecting and reflecting on the developing piece of writing, she kept infusing requirements that gave students new perspectives on their writing, like requiring at least 5 key ideas in a web with 3 details for each, or creating an illustration between the second and third drafts and then using that illustration to “paint better pictures with your words.” She shaped her instruction to meet the
expectations in the curriculum. She was a close observer of what helped her students to improve their writing.

**A College Portfolio for Student Teachers**

At the University of Florida, students are required to develop, maintain, and revise an electronic portfolio containing illustrations of proficiency in the Florida Accomplished Practices (FAP), reflection (rationale) statements, a teaching philosophy, a resume, and a personal page. At issue was the question of how to successfully infuse such an initiative program wide in a college of education and what kind of support facilitates or inhibits the diffusion of this innovation.

The purposes of implementing an electronic portfolio requirement in the college of education were many. We wanted to:

- Present illustrations of competency in the 12 Florida Accomplished Practices (FAPs – 12 professional practices which serve as benchmarks at the preprofessional, professional, and accomplished levels).
- Enable students to make decisions about what work is an appropriate example of a specific practice.
- Encourage students to reflect on their preservice teaching experiences.
- Integrate technology throughout the ProTeach curriculum ensuring that students encounter technology and develop technology-rich projects throughout the teacher education program.
- Promote the development of a professional vitae.
- Provide a better understanding of professional requirements for certification beyond the University of Florida, i.e. Certification by the National Board of Professional Teaching Standards.

The electronic portfolio project was founded on constructivist practice and was predicated on the desire to help students become more involved in their learning. Brooks and Brooks (1993) contend that two tenets of constructivist practice include the process of collaborative learning and deep personal introspection into one’s own learning process. Predictably we found that the path to involved, introspective students requires involved professors, parents, and administrators, and requires ongoing dialogue, coaching and project participation from all relevant stakeholders.

The how-to’s of portfolio development were not taught in the students’ courses; instead they attended workshops in cohorts and visited the portfolio office for additional assistance. Students collected artifacts (illustrations) from their courses, their field placements, and student teaching semester and from this collection select appropriate artifacts that demonstrate their proficiency for a particular standard, and articulated why the artifact was selected. With the presumption that assessment is learning and must be ongoing the electronic portfolio project was designed to engage students in the assessment process. Forcing students to make the argument of why their work was connected to a particular practice encouraged critical thinking and self-reflection on the part of our students. More often then not, students came to the conclusion that what was originally thought to be appropriate was, in fact, off the mark. It was through these activities (collect, select, and reflect) combined with feedback from their professors and peers that students began to understand the complexity and importance of developing a portfolio.

Although the goal of the College is to expose students to a variety of practical teaching techniques that have proven to be successful over time and to help students link these techniques with theories of learning, development, and cognition, we were not certain that we were meeting our goal. It was our hope that through the development of an e-portfolio students begin to learn to make the connections themselves and as they reflect on these connections begin to refine their thinking and subsequently their practice.

Engaging in the development of an electronic portfolio helps our students make sense of their educational experiences. Many students stated that the development of an e-portfolio forced them to reflect on what they learned in the ProTeach program.
Reflection is a crucial element in the development of teaching professionals and colleges of education must assist and encourage students to begin reflecting on instructional theories, educational experiences and teaching opportunities and help them make connections between these experiences. It was through the development of these electronic portfolios that students began to see what they were learning and that they were learning. This is evidenced by a student comment: “I didn’t realize how much I learned!” The process also contributed to a sense of empowerment for our students and, as confirmed by a student in the elementary program: “I did learn a lot, I do know how to build a website for my classes, I understand the Florida Accomplished Practices and can apply them to my teaching!”

As we review students’ portfolios and record changes in the quality of the students’ reflection statements over time in conjunction with students’ final thoughts regarding the development of an electronic teaching portfolio, it has become clear that in order for a successful portfolio initiative to be implemented in an institutional setting a portfolio culture has to emerge. Fundamental to success is the understanding that this culture does not develop overnight. Rather, it is through ongoing dialogue, support, and project revision that a portfolio culture begins to emerge.

One critical element – often overlooked, but crucial to success – is to provide support to all stakeholders. Students needed continuous access to both technical and developmental assistance in order to be successful in the development of their portfolios. Likewise, the professors needed support in their attempts to integrate portfolios into the curriculum. The support structures created by the Portfolio Office enhanced the project because all stakeholders felt that their needs, fears, and concerns were being attended to. Faculty observers commented that the patience and time devoted to the project from the Portfolio Office was crucial to project success. Similarly, one student commented that the office and director’s perseverance and dedication to the success of her portfolio was essential, “without it [support] I would still be working on my portfolio as merely a course requirement.”

Shulman argues that a portfolio does not achieve its full potential when it is not supported by conversations with professors (1988). In order for a portfolio culture to develop in a school, university or classroom, there must be dialogue between students and teachers in addition to peer-to-peer dialogue. Professors must scaffold their students in the reflection process. Without faculty participation and buy-in, the success of the entire project is in question. Without faculty facilitating the reflection process, the portfolio may not live up to its potential as a tool for student reflection.

The portfolio project is part of an intensive change effort at the college, and as such has the potential to impact the curriculum. Perhaps the most surprising side effects to occur as the college shifted to a portfolio culture were the changes in the program. When the e-portfolio project was implemented, not only did students make their work public, but also as a result of students posting their work to the Internet, the course assignments and syllabi of our faculty were made public as well. Initially, the professors were concerned that they were being evaluated based on their students’ choices. Soon, however, professors began to evaluate their course assignments based on the work their students were posting to their portfolios. More than one professor commented that they were changing their syllabus based on what they learned from reviewing their students’ portfolios. Not only were the students affected by the development of an e-portfolio, but change began to occur at the assignment, course, and program levels.

Feedback from students, faculty, and college administration was used to improve the e-portfolio project as well as the ProTeach program. Although many professors had little involvement with the portfolio project in the first year, by the third year, many were beginning to discuss portfolios with their students and were seeking ways to integrate the electronic portfolio into their courses through assignments and class discussions. As professors observe students’ increasing use of technology in their portfolios they began to take advantage of the faculty development opportunities that were available to them. As a result we are beginning to see a wider range of technology rich assignments included in the electronic portfolios.
Feedback from our students confirms our hopes….and our fears. We have learned that the development of an e-portfolio was more than just an assignment. For many, it contributed to their becoming better teachers, more reflective practitioners, and technology using teachers. These changes have the potential to contribute to the development of better teachers who will have a positive impact on the children of the future. By managing the vast amounts of information contained in their portfolios and deciding how to build a public representation of their accomplishments, our students are developing skills and perspectives that will help them in their teaching career.

On the other hand, we understand that without buy-in from our faculty, it will be difficult to gain buy-in from our students and early student success were few and far between. However, as more faculty embrace the portfolio project more students are provided with opportunities to succeed in portfolio development. The diffusion of an innovation, in our case the e-portfolio project, occurs overtime and must have support from the administration, a willingness and motivation on the part of the faulty to integrate the project into their individual classes, and participation of students to engage and work on a project that may or may not be “taught” in their courses. Sadly, the project has yet to be fully woven throughout the curriculum; predictably some programs have exhibited greater buy-in and have integrated portfolio development into their curriculum more than others. However, this has changed; with continued promotion and idea sharing we continue to see further integration moving us forward in the development of a portfolio culture in our college.

A High School Graduation Portfolio

The initial research on digital portfolios at the Coalition of Essential Schools (Niguidula 1993) focused on how the tool could be a catalyst for school reform. The goal of the portfolio isn’t just to have student work in an easily accessible location; rather, the goal is to encourage a school community to consider how it can achieve a richer picture of student achievement. A high school that is serious about changing its ways needs to start with its vision. In the years since the Coalition research, we have often started conversations with schools about the end point. How can students show evidence that they have the skills and knowledge we expect of a graduate?

For schools using digital portfolios, the ensuing discussion reinforces the notion that the digital portfolio is not primarily about technology. The conversations that emerge in schools no longer focus exclusively on how many digital cameras are required, or whether the faculty has enough technical expertise. The technology issues are still important, but they now fit into a larger context of the essential question about vision: What do we want a graduate to know and be able to do?

Thus, to implement portfolios well, schools have to begin by defining their expectations. By itself, this is not an unusual activity for a school; most (if not all) schools have created a list of what it expects of its students. With a digital portfolio, however, the expectations become much more meaningful to teachers and students. Figure 1, for example, shows a screen shot from a high school portfolio. (The example is from Ponaganset High School in the Foster-Glocester, Rhode Island, School District.) The main menu for the portfolio, along the left side, shows the school’s academic, civic, and social expectations. The main part of the screen shows the specific entries that the student has selected to demonstrate each expectation. (The Environmental Study in the example is shown to demonstrate expectations 1.01 and 1.02.)
Organizing the portfolio this way has two side effects. First, it creates a common set of expectations. All students who work with the portfolio have an understanding that they are supposed to meet all of these learning outcomes during their time in school. Second, organizing the portfolio by expectations means that students and teachers have to understand the expectations. When students enter work into the portfolio, they can decide which expectations are being met. When they first do this, however, most students are unsure what the expectations mean, let alone which ones are being demonstrated by their work. Students then often turn to the teacher and ask, “Which expectations should be linked here?” Teachers – sometimes for the first time – have to consider which standards are being met by the assignment. In many schools, a new dialog emerges, where students and teachers work together to consider what the expectations mean, and how the student work can demonstrate them. When done well, this dialog generates a common language around the expectation, and a shared vision of what students should know and be able to do.

Digital portfolios are shared documents. Students and teachers quickly realize that the work they enter into the portfolio will be seen by others. Although our portfolio systems are password-protected and often reside within a district’s local area network, the work within the portfolio is still likely to be viewed by both students and teachers. For students, the side effect is that they become more selective about what work will go into the portfolio. When given a choice, students do not typically select worksheets as a best demonstration of their skills. Students tend to select the more authentic pieces of work (even if they do not refer to them with that term); in their reflections, students note that these authentic items are the pieces that they found most satisfying, and thus are the pieces that they would prefer to share with an audience.

For teachers, the public nature of digital portfolios leads to consideration of what makes a good assignment. At a minimum, teachers need to help students make connections between the assignments and the expectations. In the implementation of the digital portfolio, then, the technical hyperlinks between assignment and expectation forces teachers to make conceptual links between their curriculum and the larger goals of the school. As the work progresses, teachers begin to think about new kinds of assignments, often using the process of planning backwards (McDonald 1992). Thus, the process of helping students enter work into the portfolio encourages teachers to reconsider their work, and how they can best help students to achieve the expectations.
In our systems, we have asked students to enter two kinds of reflections. First, students write a short reflection on each entry. If a student claims that a particular piece of work is a good demonstration of problem solving, the student's reflection on that work should say why. Second, at the end of a school year, students typically assemble an overall reflection, describing why the work in the portfolio, as a whole, shows progress.

The simple act of reflection has implications for the school culture. When first asked to write a reflection, students often have a very vague notion of what makes work “good.” Students typically start with a very mechanistic definition of what constitutes good work: work that required a great deal of effort and/or received a good grade by the teacher. One ninth grader’s reflection on a task is typical:

I know I did well because my visual was used as an example to the class. It was also successful to the sense that it fulfilled its purpose by helping me to remember the information for a quiz.

With practice and prodding, however, students start to think about their work in deeper ways. By the end of the year, this same ninth grader had other thoughts on what makes good work:

*The most important things I learned this year can be summarized into one word: connections. It seemed to me that everything we did would somehow connect to another subject! I personally find it a lot better when I can connect my school subjects to either my personal life and other school subjects. I think that is just how my mind works; things just need to make sense for me, I have great difficulty just learning facts without a reason behind them. I learned a lot about cause and effect, especially in history and biology. Things just made more sense when we knew what caused them and what came out of those causes."

*Practically everything in the portfolio demonstrates these things. Want some specific examples? The project in which we had to create our revolution to an imaginary country asked me to do just that. Not only did I have to use my creativity, but I had to come with causes and effects as well. How about the group of four lab reports that we were to do for Biology Honors? Wow! That connected to algebra, history and English! The list never ends!*

Finally, the process of reviewing the portfolio has great implications for school culture. In one school, students end the year by providing a 15-minute presentation of their portfolio to two teachers: one who currently has the student in class, and one who does not. These discussions – albeit brief – provide one of the few times that the student is asked to think about his or her learning as a whole, rather than as a series of disconnected subjects. In the process of figuring out how to best provide feedback to the students, schools begin creating new structures for collaboration. Many schools use advisory systems, where groups of 15 or so students meet with the same teacher during the four years of high school. Others adopt collaborative teams, where teachers work together to review a common set of student portfolios. Still others create new structures within departments or grade levels to promote discussion of student work. In all of these cases, though, the culture makes a shift. The process of providing feedback to students is no longer limited to grades on a report card and red marks on an assignment. Instead, the feedback on the portfolio encourages a process of personalization, and providing each student with specific, useful next steps to achieve success.

As schools begin to adopt portfolios, they begin to understand the theories of change espoused by organizations such as the Coalition of Essential Schools (Sizer, 1992): that a school has to consider itself as a whole, and see things as interconnected. Changes cannot be made in isolation and be successful or sustainable. On the other hand, digital portfolios become an entry way for that conversation. Rather than try to tackle the whole process of school change at once, digital portfolios become a
Conclusion: Common Elements

From our work in these settings, we have found that schools moving to create a "portfolio culture" must adopt the following ideas:

- The school culture must value alternative assessment. As schools move away from a reliance on standardized testing, these new forms of assessment must be integrated into the daily life of the school through the curriculum and instruction.
- Portfolios must be seen as everybody’s business. Each element of the school environment – students, parents, teachers, technologists, administrators, and others – needs to have a stake in the portfolio’s success, and must have opportunities to help shape the system.
- Students need to be seen as individuals. The long-term health of portfolio systems is dependent on the value students receive from the process. Feedback procedures that provide individualized responses need to become a central part of the culture.
- The vision for the portfolio must be shared. Participants must not only see their own role in the system, but need to understand the overall purpose of developing the portfolio. More importantly, the school needs to establish a shared vision of what it expects of its graduates.
- The need for greater communication must be incorporated into the culture. Portfolios – particularly electronic - make the work of students and teachers more public. This leads to conversations about what work is good enough – and whether the school is providing enough opportunities to learn.
- Reflection becomes the rule, rather than the exception. Developing a portfolio culture requires that students reflect on what their work represents, and that teachers provide more direct and individualized feedback than a traditional grade.

Successful use of portfolios involves a team of stakeholders that recognize the signposts of success and failure, pave the way through pro-active changes and mirror the power of reflection from the portfolio in using what they learn to make course corrections.

Educational systems, by and large, are not built upon this culture, and digital portfolios, by themselves, will not automatically make these things occur. Still, real student stories of learning are transformative. They are almost impossible to ignore. They require responsiveness. As schools figure out how to implement the portfolios, they learn how to get where they are going – yet can be changed by the journey. Talking about how learning occurs changes everything for the better.

References


PS7 - Pourquoi et comment mettre en œuvre un projet de ePortfolio?


PS11
ePortfolios, Accessibility and Inclusion
The ePortfolio's potential as enhancer of social inclusion: Reflections on U.K. initiatives in light of the EU e-inclusion policy

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Abstract: This paper argues that the ePortfolio can work as a means to enhance social inclusion if it contains a strong ‘developmental’ element. It suggests a framework for understanding the relationship between the use of ICTs and the complex dynamics of social inclusion/exclusion. It then examines the EU e-Inclusion policy to establish criteria for socially inclusive ICT projects. The paper puts forward a proposal for a ‘developmental’ ePortfolio application/process and highlights the potential, social inclusion enhancing elements of two on-going UK ePortfolio projects in light of it.

Keywords: ePortfolio, ethics, ICT, social exclusion, social inclusion, structural information inequality

1. Introduction

The electronic portfolio (hereafter ePortfolio) is commonly understood as a powerful learning, personal and career development technology that brings added value to those in education and professional life. Although the term ePortfolio means different things to different people, it tends to be seen as a toolbox for the student and the knowledge worker (e.g. Cambridge et al. 2001). This definition raises the question, what about those who are not in education, do not count as knowledge workers (e.g. manual workers) or do not currently form part of the labour force at all (e.g. long-term unemployed or people with intellectual disabilities)? If the ePortfolio is understood as something every citizen is entitled to or expected to adopt, as the ePortfolio 2004 slogan “in 2010, every citizen will have an ePortfolio” indicates, it appears justified to ask: What does it offer to the unemployed and people with learning difficulties or intellectual disabilities?

This is an important question, because there is evidence that new technologies can work as engines of both greater social inclusion and increasing exclusion (e.g. Charlesworth and Cullen 1996). In the European context, the term ‘social exclusion’ was first used, and the necessity to combat it recognised, in a 1989 Council Resolution. Over the past decade, the social inclusion/exclusion nexus has been central to the European public policy debate and to EU law (Burchardt et al. 2002a, 1-3). In the Lisbon European Summit in March 2000, the EU Member States adopted the promotion of social cohesion and inclusion as strategic goals. The EU institutions have acknowledged that some serious thought and effort need to be put specifically into ensuring that new information and communication technologies (ICTs) work as means of greater social inclusion. A key milestone in the EU’s efforts in this area is the Council Resolution of 8 October 2001 on ‘e-Inclusion’.

The EU institutions advocate a twofold conception of e-Inclusion. On the one hand, e-Inclusion refers to methods of ensuring that disadvantaged people are not left behind, and avoiding new forms of exclusion, as the information society advances. On the other hand, it means harnessing new ‘digital opportunities’ for the enhanced inclusion of socially disadvantaged people and less-favoured areas. In its Communication eEurope 2005 Action Plan: An Update of May 2004, the European Commission identified “[r]aising awareness and digital literacy in a gender sensitive way, in particular among those groups at risk of exclusion and with special needs […], as well as provision of appropriate contents and services”, as the most appropriate ways to enhance e-Inclusion (COM 2004(380), 19).

†† This research paper forms part of the UK HEFCE funded JISC Study to explore the Legal & Records Management Issues relating to the concept of the Lifelong Learner Record. The authors would like to thank David Green and Martin Rimmer for their comments and advice.
This paper explores whether, and if so how, the ePortfolio could be utilised as a means to enhance social inclusion. The paper begins by seeking to outline an accurate account of the ways in which access to and use of ICTs and social inclusion/exclusion relate to each other in today's information society. This exercise necessarily involves suggesting appropriate ways of understanding the nature of 'social inclusion' versus 'social exclusion'. It also requires taking a stance on the key factors that may prevent individuals from using and benefiting from ICTs in society. The paper then scrutinises the EU e-Inclusion policy from the perspective of the identified barriers and outlines a set of criteria for socially inclusive ICT projects. This is followed by a tentative proposal for a social inclusion enhancing ePortfolio application and process. The subsequent section reflects on developments in two of the on-going ePortfolio projects in the UK. The brief discussion of the projects highlights a number of substantive measures through which ePortfolio technology, and those providing related support services, might be able to contribute to enhancing social inclusion of currently disadvantaged citizens. The paper concludes with some recommendations for improved ePortfolio policy and practice.

2. Understanding barriers to harnessing ICTs for enhanced social inclusion

Any investigation into appropriate means to enhance social inclusion has to begin by laying out at least a preliminary account of what social exclusion and inclusion might entail. Although there is no consensus as to precise definitions for these concepts, most scholars agree that the state of being ‘socially included’ versus ‘socially excluded’ is rooted in individuals’ and groups’ degree of participation in the main social spheres. Warschauer (2002), for example, suggests that social inclusion/exclusion refer to “the extent that individuals, families, and communities are able to fully participate in society and control their own destinies”. Burchardt, Le Grand and Piachaud provide a working definition according to which “[a]n individual is socially excluded if he or she does not participate in key activities of the society in which he or she lives […] for reasons beyond his/her control, and [although] he or she would like to participate” (2002b, 30).

If this understanding of social exclusion is accepted, the next task becomes to identify the ‘key’ social activities. There appears to be broad agreement on the social spheres and activities in which participation by individuals is of primary importance. Selwyn provides one account of that consensus view which he calls “the various dimensions of participation in society”. In this account the dimensions are production activity, political activity, social activity, consumption activity and savings activity (Selwyn 2004, 350-351). Burchardt et al. (2002b, 31) reduce these dimensions/activities to four by considering savings activity as a subset of consumption activity. They regard participation in every one of the four dimensions/activities as a necessary condition for social inclusion, but stress that there are various degrees of participation. This paper suggests that seeking to understand individual’s and group’s experience of (in)equal opportunities to engage in the four types of activities is perhaps more significant than trying to establish any fixed thresholds of inclusion/exclusion.

In order to assess what role ICTs might play in enhancing peoples' ability to be active citizens and whether lack of access to them significantly contributes to exclusion, it is useful to provide a brief outline of each of those key societal activities. Production is understood as comprising of highly valued economic and social activities, including engaging in paid work, education, training or caring for a family etc. Prime examples of political activity are involvement in local and/or national decision-making. At the heart of social activity are interaction with family and friends and positive identification with a community or a group. Consumption activity involves having the capacity to purchase goods and services at a level beyond minimum subsistence. Its sub-dimension, savings activity, is manifested as accumulation of financial capital and owning property (Selwyn 2004; Burchardt 2002b).

It is quite apparent that all these key activities of the society have been colonised by ICTs, although some to a much greater extent than others. Various ICTs are central to the ways in which most paid work is carried out, ranging from manufacture and
service industries to most office based work. With the advent of on-line recruitment and e-Learning, participation in production activities, including education and training, requires access to ICTs and the capability to use them efficiently. E-Democracy and e-Government initiatives are also putting ICTs at the centre of basic forms of political participation (e.g. Hacker and van Dijk 2000). Moreover, e-Commerce and on-line banking are shaping our ideas about what counts as rational consumption and savings modes. Access to on-line shopping may enable consumers to get better deals, and Internet bank accounts often offer higher interest rates for savings than those available on the high street. Furthermore, our participation in social activities is also influenced by ICTs. E-mail provides an easy and efficient way of keeping in touch with family and friends. Most community organisations and groups use web sites as a means to publicise their views and activities and some groups operate entirely in the virtual reality of the Internet. Perhaps less obviously, increasing opportunities for on-line dating might be transforming the ways in which people kindle personal relationships. In conclusion, the inability to use necessary ICTs will reduce the extent to which people have the opportunity to participate in any or all of the four key social fields described.

Now that a link between access to, and use of, ICTs and the opportunity to fully participate in the four key social spheres has been established, it becomes imperative to explore obstacles to using and benefiting from ICTs. This approach assumes that new ICTs will only be successfully harnessed for the enhanced inclusion of socially disadvantaged people, where those involved in their provision have a thorough grasp of the type of barriers with which disadvantaged individuals are confronted. In other words, any meaningful policy or project that wishes to exploit ‘digital opportunities’ for the benefit of everyone must be based on a realistic picture of the current state of affairs.

The term most commonly used to describe the current situation is that of the ‘digital divide’. This concept was initially used to signify a reality in which the world’s population falls into two categories; those that possess computers and network connections, or have an easy access to them, and those who do not. Initially, the lack of access to ICTs seems to have been regarded primarily as an economic issue. However, the utility of such a narrow conception of the digital divide has increasingly been contested, in particular by academics writing on ICT and social exclusion, social (in)equality or information poverty (e.g. Loader 1998, Patterson and Wilson 2000, Norris 2001, Britz 2004). The dissatisfaction with that interpretation has led to several recent attempts to redefine or ‘remap’ the digital divide (e.g. Strover 2003, Warschauer 2003b). These redefinitions of the nature of the divide have considerably developed the technology access and operational digital skills-centred understanding of the contributing factors.

Over the past few years, researchers such as Van Dijk and Hacker (2003), Selwyn (2004) and Warschauer (2003a) have sought to provide more encompassing, sociologically informed interpretations of the digital divide. They have put forward differing, although not necessarily conflicting, frameworks for understanding the complex dynamics surrounding ICT and social inclusion/exclusion. The frameworks suggested by van Dijk and Hacker, on the one hand, and Selwyn, on the other, appear most helpful for the purposes of this paper. Van Dijk, Hacker and Selwyn are all seeking to identify the main reasons and conditions behind individuals’ varying use of ICTs and their ability to benefit from them in the form of enhanced inclusion in society (as defined above). Selwyn’s suggested sociological framework, and van Dijk and Hacker’s empirically grounded account of main barriers to ICT use, complement and augment each other in important respects. This paper will thus adopt an approach that combines selected elements of their frameworks. Prior to articulating that approach, it is necessary to specify the use of the concept ICTs. For the purpose of this paper, the concept ICTs are restricted to computer hardware, software applications and the Internet.

In reconsidering the digital divide, Selwyn (2004) distinguishes between ‘inequalities of opportunity’ to access and use different ICTs, and ‘inequalities of outcome’. The latter refers to the degree in which the individual is able to participate in production, political, social and/or consumption activity as a consequence of (lack of) ICT use. Because this paper is concerned with whether, and how, the ePortfolio could
enhance currently disadvantaged people's opportunity to participate in these valued activities, it focuses on making sense of the inequalities of opportunity to use ICTs. In Selwyn's view, the opportunities to access and use ICTs are best understood as stages. The stages involve a progression from formal material access, over effective or factual ability to access and use at least some ICTs, to 'meaningful use' of ICTs. Here meaningful ICT use is understood in terms of the user having some control and choice over the technology and content and the ability to advance his/her aspirations via this use (Selwyn 2004, 351-352).

Van Dijk and Hacker (2003) put forward a similar argument, albeit in somewhat different terms and with a greater degree of specification. They distinguish between four successive kinds of ‘access’ to ICTs: mental or motivational access, material access, skills access and usage access. The lack of any or all four types of ‘access’ count as barriers to using and/or fully benefiting from ICTs, where benefit is defined as enhanced participation and position in society. Van Dijk and Hacker’s attempt to reinterpret the digital divide by widening the definitional scope of the term ‘access’ may not be entirely appropriate. The ordinary language use of the term ‘access’ has a sense of immediacy and material or physical quality to it. Hence, suggesting that cognitive factors, level of digital skills and ICT usage patterns can be subsumed as forms of ‘access’ impoverishes the debate. Nevertheless, their overall argument, regarding the underlying reasons for why some individuals engage successfully with computers and the Internet, and others do not, is convincing.

Where Selwyn widens our understanding of the mediating factors contributing to (lack of) engagement with ICTs, van Dijk and Hacker pin down specific barriers to actual and socially empowering engagement. The introduction of the idea of different form of 'capital', i.e. economic, cultural and social capital that individuals may or may not possess, which Selwyn (2004, 352-354) adopts from Bourdieu (1997), provides an appreciation of the role that social and cultural dynamics play in ICT access and use. However, in order to assess the adequacy of the EU e-Inclusion policy and to suggest an inclusive ePortfolio model, it is necessary to be more specific.

The barriers or hurdles to computer and Internet use identified by van Dijk and Hacker have to do with personal attitudes and abilities, material resources and, perhaps most importantly, specific social skills and habits that an individual may not posses. The first, cognitive, hurdle involves “lack of interest, computer anxiety, and unattractiveness of the new technology” leading to “lack of elementary digital experience” (van Dijk and Hacker 2003, 315). Computer anxiety, often involving experiences of personal shortcoming and insecurity, is experienced especially by those with limited education, (functional) illiterates and older people (van Dijk and Hacker 2003, 317; also Stanley 2003).

The second barrier is the familiar lack of material access. Not possessing a computer and/or a network connection is often due to lack of ‘economic capital’ (i.e. material resources and purchase power) to use Bourdieu’s term introduced to the discussion of the digital divide by Selwyn (2004, 353). However, van Dijk (2004 and forthcoming) makes an important distinction between ‘physical access’ and ‘conditional access’ barriers. The former refers to possession of a computer and an Internet connection and the latter to having to acquire a username and password by paying a membership fee to a service provider. Even if individuals with low incomes are provided with financial support to obtain computers, the acquisition and maintenance of Internet access presents them with an additional financial burden.

The third kind of hurdle to using and benefiting from ICTs relates to the level and quality of digital skills that the individual possesses. Van Dijk and Hacker augments the conventional conception of digital skills, defined as the ability to operate computer hardware and software. Although important, operational skills are only one of three forms of digital skills needed to fully benefit from ICT. The other two are informational skills and strategic skills. Our informational skills involve being able to “search, select, process, and apply information from a superabundance of sources”, without which access to the Internet is of limited practical use (van Dijk and Hacker 2003, 316). Strategic skills comprise “the ability to use digital means to improve one’s position in society, in work, education and cultural practices” (van Dijk and Hacker 2003, 324). It appears reasonable to suggest that this ability has to do with possessing what
Bourdieu (1997) termed ‘cultural capital’. Cultural capital is best understood as embodied knowledge, gained through socialisation into the dominant culture, about how key social practices, e.g. the labour market or educational systems, work and how to advance in them. Selwyn suggests that being socialised into the ‘technoculture’ through one’s close social contacts, e.g. family, neighbourhood or a community, is an important technological form of cultural capital (2004, 353).

With the advent of e-Learning, e-Government, on-line recruitment, banking and dating etc., strategic digital skills are increasingly important if one wishes to reach one’s goals in life, as was indicated earlier. Hence, informational and strategic digital skills are the most decisive factors contributing to one’s capability to participate and thrive in today’s society, whereas the lack of them contributes to social exclusion. The significance of these skills and possible means of developing them will be dealt with in more detail at the end of this analysis of van Dijk and Hacker’s account of barriers to benefiting from ICT.

The fourth barrier or hurdle relates to actual computer usage, i.e. “differences in the number and kind (diversity) of computer and Internet applications used” by individuals (van Dijk 2004, 34). Van Dijk has identified a significant divide in this area that he calls a ‘usage gap’. Some sections of society use advanced, businesslike applications while others’ use is limited to simple, entertainment-focused ones, including games, electronic shopping and payment, and simple messaging (van Dijk 2004, 29). The limited use of ICTs may be due to: restricted usage opportunities; lack of time, motivation or incentive; limited knowledge of the opportunities and benefits provided by ICT; or lack of understanding of the potential adverse effects of not using advanced digital technology (van Dijk 2000, 174-176). Nonetheless, the usage gap gives reason for concern. Although computer and video games can be used for educational purposes (e.g. Graham-Rowe 2003, Anon 2002, 2004), playing normal video games or shopping on-line is unlikely to develop either one’s informational or strategic digital skills or one’s cultural capital, the lack of which were identified as the most important contributors to social exclusion. Van Dijk and Hacker predict that “different uses of ICT will bring the most important digital and information inequalities in society” (2003, 320).

The critical element of van Dijk and Hacker’s argument, as well as that of Selwyn and Warschauer, is that simplistic conceptions of the ‘digital divide’ have resulted in inadequate policy responses to a new social problem - the true nature of which we are only beginning to grasp (van Dijk 2000; van Dijk and Hacker 2003; Selwyn 2004; Warschauer 2003a). Van Dijk and Hacker stress that “the current digital divide is a very complex and dynamic phenomenon”. It is complex because it involves not only material access, but also cognitive factors, a multitude of skills and usage patterns each of which presents their own challenges; and dynamic in that it “…follow[es] the trends of evolving technology and its uses” (van Dijk and Hacker 2003, 323). Whereas material access to ICT has been the main concern of e-Inclusion policies, the three other types of hurdles limiting ICT use have been largely neglected. While policy makers are taking credit for decreasing the digital divide defined in narrow, physical access terms, the structural divides concerning digital skills and usage are a real and potentially growing threat to social inclusion (van Dijk and Hacker 2003, 322; Selwyn 2004, 357).

In his forthcoming book, van Dijk will argue that we live in a ‘tripartite network society’ characterised by ‘structural information inequality’. Here ‘structural information inequality’ is defined as “[s]ystematic exclusion, absolutely or relatively, of parts of the population from several fields of society as they lack access to vital

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1 It is possible to take Selwyn’s argument and consider what might count as ‘cultural’ barriers to ICT use, an issue to which perhaps van Dijk and Hacker do not pay sufficient attention. The key issue appears to be how different cultural groups view the desirability of assimilation or socialisation into the dominant culture. The US digital divide surveys have repeatedly shown clear differences in ICT uptake between ethnic groups that cannot be explained simply by reference to income. In addition, some cultural groupings, for example the Amish and Hutterite religious sects, actively avoid adopting modern technologies. In Europe, the capacity of current educational ICTs to engage traditionally excluded cultural groups such as Travellers and Gypsies might provide an interesting case study. It may also be possible to identify cultures or societies that do not encourage (or actively discourage) women attempting to gain digital skills. See for current ‘cultural’ issues in the education sector, Anon. ‘Gangs who fail exams on purpose’, BBC Online, 17 September, 2004 <http://news.bbc.co.uk/1/hi/education/3663916.stm> (accessed 07.10.04)
sources of information; in this case because they lack particular kinds of access to the digital media" (van Dijk 2004, 23). As a consequence, a new ‘class structure’ is emerging, where the population is divided into the information elite, the participating majority, and the disconnected and excluded. The members of the information elite are connected to each other by multiple social and media network links, some of which extend to the members of the participating majority, whereas the rest fall outside the reach of such links. Van Dijk (2004) concludes that the new ‘class division’ penetrates all the four key spheres of societal activity and that we are witnessing the creation of first, second and third class citizens, workers, students and consumers.

Selwyn complements this (bleak) interpretation by pointing out the centrality of social networks and in particular ‘technological contacts’ and support, i.e. social capital, in determining whether or not an individual or a group is capable of adopting ICTs and acting as efficient information users (2004, 355). In the production sphere, for example, disconnected workers will face a limited choice of job opportunities unless or until they are able to acquire sufficient amount of economic, social and/or cultural capital needed to gain access to and make efficient use of ICTs.

What is to be done about structural information inequality? How might the four main types of barriers to efficient ICT use be lowered or overcome? How could individuals be facilitated in ‘accumulating' relevant forms of cultural and social capital? Ethically, it is clearly indefensible for society in general, and ePortfolio projects in particular, to fail to attempt to address these issues. Neither is it justifiable to permit the creation of ePortfolio applications which will have the net effect of contributing to structural information inequality. In order to identify criteria for social inclusion enhancing ePortfolio projects, it is useful to assess the extent to which current EU e-Inclusion policy is effective in tackling the four types of barriers faced by disadvantaged citizens.

3. The EU e-Inclusion policy under scrutiny: Criteria for socially inclusive ICT projects

The EU e-Inclusion policy spans a number of policy sectors, including those of education and training, employment, and social cohesion. The document that most clearly outlines this policy is the Council Resolution on ‘e-Inclusion’ – exploiting the opportunities of the information society for social inclusion. The policy was preceded by the ‘eEurope 2002 Action Plan’, and has been influenced by subsequent Commission Communications that have stressed the need to prevent a ‘digital divide’ and avoid ‘info-exclusion’ in Europe. The Council regards the e-Inclusion policy recommendations to the Member States as a contribution to the EU’s fight against poverty and social exclusion. Although the Council Resolution is not legally binding on the Member States, it is indicative of the direction of European Union policy in this area.

The e-Inclusion policy sets out three overall goals: 1. Utilise the information society's potential for disadvantaged people, 2. Remove barriers in the information society, and 3. Encourage partnerships between all stakeholders (with an emphasis on the regional and local dimensions). The first two goals are of most interest here, although removing barriers appears logically prior to utilising potential. The Council has identified a number of specific measures through which to attain each goal. If one accepts the interpretation of the current situation outlined above in tandem with van Dijk’s future scenario, it is important to ask: Do the measures in the EU e-Inclusion policy tackle structural information inequality? This will require a brief evaluation of the key elements of the policy in light of the four types of barriers faced by disadvantaged individuals, with special emphasis on the final two, the tripartite digital skill barriers and the usage gap.

It is possible to argue that psychological barriers to ICT use can be alleviated through awareness programmes among those lacking elementary digital experience. The EU e-Inclusion policy suggests raising awareness of the information society’s opportunities, as well as its challenges, among disadvantaged groups, and the technology-shy in particular. However, in order to be effective, such information campaigns must be coupled the ability to provide people with that crucial first positive experience of using ICTs. This could take the form of experimentation with very easily accessible and user-friendly web sites and software applications that are
unambiguously useful for the individual in question, e.g. on-line recruitment sites and word processor for the unemployed (van Dijk and Hacker 2003, 325). The e-Inclusion policy does advocate the enhancement of ICT accessibility by means of tackling technical barriers and promoting the development of specific software. Both of these measures have the potential of contributing to lowering the ‘computer anxiety’ barrier and encouraging people, including those with disabilities, to use at least some applications.

The second barrier, material access, is addressed by the EU e-Inclusion policy. It advocates a number of potentially effective measures for making ICT access available and affordable, including setting up public Internet access points that feature free access and on-site training, and providing incentives for ICT purchase and use by disadvantaged individuals. Ensuring universal access to the Internet is a question of making public resources available for the creation of sufficient number of well-thought-out community access points. In light of the existing usage gap, however, the crucial questions appear to be whether and what kind of software applications, training and advice are to be made easily and cheaply available to the currently disconnected and excluded. Unfortunately, these questions are not addressed in the EU e-Inclusion policy.

To what extent do the various measures outlined in the EU policy then tackle those barriers to benefiting from ICT which are caused or exacerbated by digital skills shortages and ‘underdeveloped’ usage patterns? The policy outlines the promotion of digital literacy as one of its key measures, thus recognising the importance of operational computer skills. It recognises the need to gear digital literacy training towards those with ‘specific learning needs’, which could be interpreted as ‘people with learning difficulties or intellectual disabilities’, and advocates the development of networks of e-Learning centres for their benefit. This initiative is to be welcomed. Van Dijk and Hacker’s research shows that the majority of people learn digital skills at work as opposed to at school or at home (2003, 326). Hence, many of those outside the work force and in manual jobs will remain beyond the reach of digital skills training, unless special services, such as e-Learning centres, are made available to them. The significance of making ICT skills training, including support for the development of operational, informational and strategic skills, available to those who do not count as ‘knowledge workers’, cannot be overestimated. Unfortunately, the EU e-Inclusion policy fails to explicitly recognise and tackle lack of informational and strategic digital skills as a key barrier to social inclusion. One might be able to argue that realising ICT job opportunities by providing disadvantaged individuals ICT training and other learning opportunities could be interpreted to include training in informational and strategic skills. Still, ICT jobs, and consequently such training (e.g. the European computer driving licence), may be beyond the reach of someone with learning difficulties or an intellectual disability. Thus the recommendation that disadvantaged individuals should be provided with on-line recruitment opportunities appears quite ironic in the face of the informational and strategic skills shortage that many of them are likely to experience.

To tackle this issue, it may be necessary for those committed to e-Inclusion to go ‘back to basics’. Adult basic skills training and maintenance would seem like the appropriate place to offer both elemental digital and informational skills training to those with learning difficulties or intellectual disabilities. Those currently disadvantaged on grounds other than disability could be guided to lifelong learning institutes, whose curricula should be adjusted to include instrumental and strategic skills training. Furthermore, there remains much to be done in the field of special educational software and related support that is geared towards the needs of ‘underserved groups’ (van Dijk 2003, 32). It is also important to find ways to make essential information about vital services very easily available online without also accepting a concomitant reduction in face-to-face social services and support (e.g. Geary and Leith 2001).

The latter issue has to some degree been addressed by the EU e-Inclusion policy. The Council Resolution advocates the facilitation of appropriate online-content and services to currently excluded individuals and groups. In particular, it supports the creation of targeted on-line services in many vital areas for those with special needs,
including social protection, education, employment, health, housing and justice. Nevertheless, unless both the usage opportunities and the information and services available are truly attractive and generate added value to the users, information ‘have-nots’ and especially ‘want-nots’ are unlikely to be convinced. The attractiveness of those elements will inevitably implicate issues of language, design, cultural sensitivity and relevance as well as identity (e.g. van Dijk and Hacker 2003; Stanley 2003).

At least part of what counts as ‘appropriate on-line content’ must be left for underserved individuals to determine for themselves in order to ensure their engagement (e.g. Hellawell 2001). However, the nature of the ‘usage gap’ described above will require that such facilitation will need to proceed with some caution, if it is to have the desired effect of being broadly inclusionary as opposed to simply providing a narrow inclusionary facade. To provide an example, if an unemployed individual is used to at killing time by playing computer games, one result of the provision of online services may be that they simply use that provision to acquire more games, or to develop a ‘game chat-line’. In narrow inclusionary terms, they are bridging the digital divide by virtue of their digital connection, but in the broader sense, they may well remain as unconnected to the necessary social elements of true inclusion as before. While it is important to avoid adopting a patronising approach, there is much to be said for combining communal on-line content and services development projects with well-though-out awareness campaigns that stress the importance of developing and using one’s digital skills, widely defined. In other words, information campaigns ought to be geared towards the promotion of useful ICT applications as opposed to simply praising the merits of being connected to the Internet (van Dijk 2004, 32).

In sum, although the EU e-Inclusion policy addresses material access to ICT, ICT accessibility and stresses the need to invest in the promotion of operational digital skills, it fails to recognise what might be termed the root causes of social exclusion in information society. As our discussion of van Dijk’s, Hacker’s and Selwyn’s reinterpretations of the ‘digital divide’ have demonstrated, the relationship between ICT and social inclusion/exclusion is a wider and more complex sociological issue than simply ICT access and accessibility. Warschauer (2002) reinforces the point by arguing that “[w]hat is most important about ICT is not so much the availability of the computing device or the Internet, but rather people’s ability to make use of that device and line to engage in meaningful social practices”. The experience of different individuals and groups of being socially included or excluded has to do with whether they are able to participate in a fulfilling manner in such social practices as education, employment and democratic governance. The full participation in any or all of these practices requires a reasonably high level of operational, informational and strategic digital skills and an aptitude to use advanced software applications. In light of this fact, van Dijk and Hacker put it well when they state “[t]he fundamental task of the future society will be to prevent structural inequalities in the skills and usage of ICTs from becoming more intense” (2003, 324).

4. Social inclusion enhancing ePortfolio applications: Initial suggestions

As already noted, developing ePortfolio applications and projects must avoid inadvertently adding to the existing structural inequalities. On the contrary, such applications and projects ought to be actively developed and harnessed as means to help disconnected and excluded citizens to at least become part of the ‘participating majority’, if not necessarily the ‘information elite’ (van Dijk 2004). To achieve this, those involved in the development and implementation of ePortfolio applications cannot limit their view on how to enhance social inclusion to that of the EU e-Inclusion policy.

There are no ‘quick fixes’ to allow currently disadvantaged individuals to experience themselves as empowered and valued participants in society. Being lifted or lifting oneself from a disadvantaged position is a longer term process. Interestingly, the notion of ‘process’ is also central to the ePortfolio. Higher and further education students’ and knowledge workers’ Personal Development Planning (PDP), facilitated
by ePortfolio technology, is a process through which they seek greater fulfilment in educational, career and personal life. The PDP process involves reflection on one's own learning and achievements and requires a proactive stance on one's overall life and career development.

It appears that in order for someone to be capable of entering, following through and benefiting from such a process, they already need to possess high level of skills and competencies. However, a significant number of people in European societies lack adequate basic skills, have learning difficulties or are immigrants with poor language skills. There are also individuals who have been unemployed for a long time, those who have significant mental health problems, who are leaving care or prison, and the homeless. The process that people in these situations may need to undertake to become fully empowered actors in society is quite different from the process through which the knowledge worker advances his/her personal aims. Despite this, it is proposed that targeted development and implementation of appropriate ePortfolio applications could help disadvantaged people to acquire vital digital skills, gain self-confidence, develop a sense of being valued, begin communicating and participating in society and enhance their employability. Facilitating some or all of these positive changes in people who experience exclusion in any or all key social spheres ought to be set as the prime purpose of special ePortfolio initiatives. Moreover, any national or European project introducing the ePortfolio to all citizens needs to be able to accommodate, and provide added value to, people with special needs.

On the basis of the foregoing discussion, this paper suggests three overall criteria for a ‘developmental’, social inclusion enhancing ePortfolio application. First, it ought to be fun and flexible, in the sense of starting with some simple, perhaps game-like tasks and progressing step-by-step towards more useful portfolio tasks while developing an individual’s operational and informational digital skills. Second, it ought to be part of a virtual learning environment (VLE), which facilitates communication among the members of specific, closed groups, e.g. a group of people with disabilities, and which contains suitable, including very basic, learning materials and links. Third, it ought to contain a tool that enables disadvantaged people to experiment with different identities and possible futures, including paid or voluntary work, or roles in community life.

Although it is a truism that ‘one size does not fit all’, it is important to put forward concrete suggestions as to how a ‘developmental ePortfolio’ containing the above elements and the accompanying, supported process could be constructed. It is also important to remember that any suggested model will need to be developed in active collaboration with the people for whom it is designed.

The first logical stage of an assisted ePortfolio process geared towards the needs of our target group is to permit them to overcome possible cognitive barriers regarding the use of ICT and to believe in the possibility of improving their own situation. Facilitating experimentation with very easily accessible, user-friendly and fun software applications, such as games or quizzes, and providing websites that are unambiguously useful to the individual in question are potential developmental avenues.

Once these fundamental barriers have been lowered, activities designed to build self-confidence and teach basic digital skills such as simple messaging can be introduced. In the second stage of the process, both of these functions could be achieved by forming a group of people experiencing similar difficulties and facilitating communication among them. The group would be taught how to use email and built an own simple and accessible web site as part of a designated VLE. The website would include everyone’s pictures, names and emails, including the possibility to send a message to a fellow group member with two mouse clicks. Research has shown that the possibility to easily reach out to other human beings, even if only to say ‘hi!’, significantly enhanced the confidence and well-being of the members of a group of disabled people (e.g. Seale and Pockney 2002).

In the third stage, the process could move towards the development of slightly more advanced digital skills. Teaching people how to use a word processor with the purpose of them being able to write a brief story about themselves might be an idea. The initial self-presentation would be saved as the first document in a personal