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TECHNOLOGY



ALT-SURF seminar

ePortfolios and Digital Repositories
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Contents

1	Introduction: the first joint ALT-SURF working seminar on ePortfolios and Digital Repositories	3
2	ePortfolios in the Netherlands and the UK	4
2.1	Working group participants	4
2.2	Introduction	4
2.3	Beliefs: the concept of ePortfolio in the UK and the Netherlands	5
2.3.1	Differences between the UK and Netherlands	7
2.4	Achievements	8
2.5	Differences and similarities	8
2.6	Challenges and collaboration	9
2.7	Follow-up actions	10
3	Digital Repositories briefing paper	11
3.1	Working group participants	11
3.2	Introduction	11
3.3	Reasons for interest	12
3.4	Beliefs about digital repositories in the UK and the Netherlands	12
3.5	What has been achieved?	13
3.6	Challenges and Issues	13
3.7	Collaboration	17
4	References	18

1 Introduction: the first joint ALT-SURF working seminar on ePortfolios and Digital Repositories

ALT (Association for Learning Technology) and SURF (collaborative organisation for IT innovation in Dutch HE) have similar goals and started working together in 1999. In 2001 they signed a Memorandum of Understanding to bring together learning technologists from the UK and the Netherlands in a variety of exchange activities. Sharing experiences and views internationally between peers proved to be an excellent way to learn new things, find inspiration to meet joint challenges and engage in healthy reflection.

ALT and SURF organised mutual study visits (50 Dutch learning technologists visited universities in the UK in 2002 and 40 UK colleagues visited Dutch institutes in 2003), joint conferences and seminars, and an expert study trip to Australia (8 UK and 8 Dutch experts visited 14 institutes in 2002). SURF and ALT reported on these in presentations and publications.

A new activity is the joint working seminar, where a specific theme can be discussed by experts in the field with the purpose of describing in a so-called ‘briefing paper’ the current state of affairs, the underlying beliefs, hopes and desired situation, and possible ‘next steps’ in joint conceptualisation and/or developing activities. In the process of composing the briefing papers differences between the countries will surface, e.g. organisational, cultural or political. The themes are therefore not isolated topics but seen as developments within a context.

The first joint ALT-SURF working seminar took place in April 2004 in Edinburgh, immediately following an ALT spring conference, and addressed two related topics: e-(or Digital) Portfolios and Digital Repositories. The aim was to establish working relationships between experts in both countries through discussion and collaborative writing of briefing papers aimed at experts, researchers, managers and policy makers.

The objectives of the working seminar were threefold:

- describe the basic belief that leads to so much energy being put into these concepts
- outline current thinking in ePortfolios and Digital repositories as a common reference point for deeper understanding
- devise a roadmap to meet required conditions to further develop ePortfolios and Digital Repository concepts and use.

This report is the result of that seminar, namely a briefing paper on ePortfolios and another on Digital Repositories. In the papers the potential and ultimate goal of using ePortfolios and Digital Repositories for learning and teaching is outlined; the current state of achievements is described, and thirdly the briefing paper concludes with desired next steps to reach the ultimate goals, what conditions need to be in place, what activities need to be set in motion. The papers highlight any apparent differences in approaches between UK and Netherlands as well as opportunities for future collaboration. SURF and ALT will use the conclusions and suggestions as input for joint future development and networking activities.

We wish you an interesting read.

Rhonda Riachi, ALT

Bas Cordewener, SURF

2 ePortfolios in the Netherlands and the UK

2.1 Working group participants

Netherlands:

Marij Veugelers (chairperson working seminar ePortfolio), Wijnand Aalderink
Alex Kemps, Sanne Meeder, Jan van Tartwijk, Freddy Veltman.

UK:

Simon Atkinson, Paul Bailey, Rae Condie, Lisa Corley, Simon Cotterill,
Colin Dalziel, Jonathan Darby, Rachel Ellaway, Dick Hill, Alison Hudson,
Derek Morrison, Peter Rees Jones, George Roberts, Janet Strivens,
Shane Sutherland, Jean Ritchie, Rhonda Riachi.

USA:

Alice Brainerd

Paper prepared by:

Simon Cotterill, Jonathan Darby, Peter Rees Jones, George Roberts
Jan van Tartwijk and Marij Veugelers.

2.2 Introduction

This briefing paper presents perspectives on the current state of developments in the use of ePortfolios in higher education in the UK and the Netherlands. The paper is the output of a two-day ALT-SURF event held in Edinburgh on 21 and 22 April 2004. The participants at the event were those involved in, or interested in, ePortfolio, research and use in the Netherlands and the UK. The experiences and perspectives from participants from the two countries proved distinctively different as this paper reveals but the combined insights proved particularly productive when working out a shared view of the real value of ePortfolios. With significant developments likely in ePortfolios at national and European levels, ALT and SURF, by continuing to work together, are well placed to play a significant role in influencing ePortfolio standards and practice.

Where do portfolios come from?

Portfolios have been used for assessment in fine art for more than a century but their use outside this specific field is more recent. They started to be used in teacher education in the US in the late nineteen eighties, as an alternative to exams and assignment. They sought to address the criticism that established assessment fails to take account of the context in which both student teachers and teacher trainers perform their tasks. Portfolios were used as 'mobile assessment centres' in which exercises in the assessment centre were replaced by portfolio entries (Shulman, 1998ⁱ). In these portfolios real work was presented by using entries such as texts, photographs, videos, written feedback, etc. Captions were used to describe the context in which these entries were gathered and why the portfolio owner selected them for inclusion in his or her portfolio. Subsequently, the portfolios were assessed by one or more assessors, using a qualitative approach to assessment (Driessen, van der Vleuten, Schuwirth, van Tartwijk & Vermunt, in pressⁱⁱ). Despite fierce criticism of the psychometric quality of this new form of assessment, portfolios are becoming increasingly popular both within and without the field of teacher education, because of the unique opportunity they provide to take into account the real world in which people live and work with its opportunities for performance and personal growth as well as its barriers.

Portfolios in Europe

During the last decade, the portfolios are used in many diverse ways in the US. There is no wide-spread uniformity amongst US schools in the use of portfolios. Usage varies from documentation of academic and career activities to assessment, advisement, and reflection, based on each school's objectives. In Europe however, further components have been added to portfolios, such as reflective statements on various professional/academic roles and personal development plans (van Tartwijk et al., 2003ⁱⁱⁱ). These components extend the purpose of portfolios to include self-reflection and personal development planning.

These new goals and related components have led to a broadening of what is embraced within the concept of portfolios. In the UK, for instance, portfolios are most commonly regarded as tools for personal development planning in the context of lifelong learning. They may be used in lieu of a CV and their make-up reflects this. In the Netherlands, the pedagogical function of portfolios is the main reason for their use. As a consequence, reflective statements by the portfolio owner, underpinned with supporting evidence, have become the core of the portfolio in many schools, colleges, universities and companies.

Electronic Portfolios

Because portfolios grow over time, portfolios with paper entries tend to become increasingly difficult to manage, store and circulate. To solve this problem, electronic portfolios have grown in use over the last five years both in the US and Europe. These ePortfolios are often Web-based, facilitating access and portability. The added possibilities enabled by online access have stimulated experts and practitioners to broaden their scope beyond their national and educational and professional domains. Eventually we hope this will lead to new and shared concepts, standards and tools for ePortfolios. In Europe this has resulted in initiatives like the EPICC project in which partners from various countries and background are collaborating to identify portfolio-standards.^{1v}

2.3 Beliefs: the concept of ePortfolio in the UK and the Netherlands

How do people learn? Learning by doing

Educational developers and policy makers in both the UK and the Netherlands as a theoretical basis for educational reform embrace constructivism. Learning is seen as a process in which individuals give meaning to new information and experiences, using what they already know and have experienced. Reflection is considered as a key activity in this process. This process of giving meaning is context-bound. Applying knowledge and skills when fulfilling tasks is something that people do in the context in which they have acquired these knowledge and skills.

What is good education?

As a consequence of this constructivist approach, criteria for good education inclusion of well considered student activities, how realistic tasks are and how much capacity there is for individual development. Education should not focus on knowledge transfer, but on developing people's ability to fulfil tasks in relevant contexts, in other words their capabilities.¹

Capabilities

Capabilities can be defined as the integrated sum of knowledge, skills and attitude necessary for the fulfilment of specific tasks in specific contexts. Acting and improving in learning cycles develop capabilities. The starting point for a cycle could be considered the moment people set new goals, taking into consideration their previous experience. Subsequently they start fulfilling relevant tasks in realistic situations, reflect on the results, set new goals and so recommence the learning cycle.

Because such learning cycles are initiated by goals, which are based on previous experience, they should be tailored to the individual learner. Being able to learn from such cycles is considered an important capability itself. Learning to learn should be a major goal of education as well.

Lifelong learning

Learning does not stop after leaving school or university, but is something that people do their entire life. Capabilities, for instance, which were acquired in the nineteen seventies will probably be quite out of date now.

However, lifelong learning is often informal in nature and as such may go unrecognized. Government policy on education (especially in the UK) is now paying more attention to lifelong learning and the recognition of informal learning through, for example, developments in recognition schemes for workplace learning.

¹ The term 'competentie' is widely used in the Netherlands. It has to do with being able to get things done. For English-speakers the term 'competence' is problematic because it is linked to behavioural outcomes. The term 'capability' is perhaps a better term for what ePortfolios seek to evidence.

ePortfolios

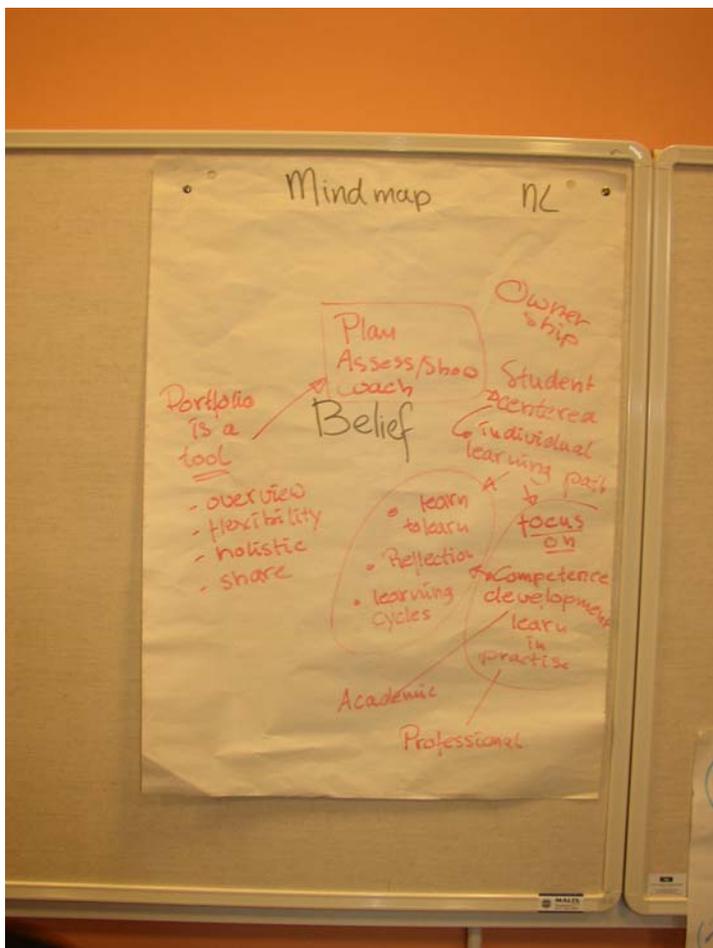
ePortfolios require instruments to support:

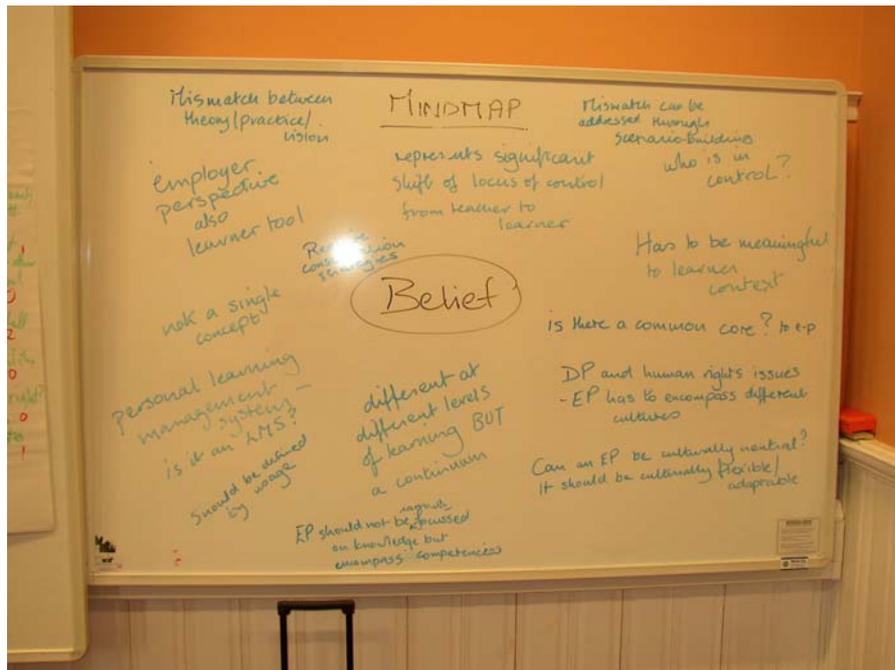
- the development of individual capabilities
- learning in practice
- learning to learn
- lifelong learning requirements.

These instruments should help students (and their mentors) to:

- get a clear picture of how the learner has performed
- reflect on strong and weak points
- plan further development.

ePortfolios at their best can adapt to an individual's development and profile, provide a holistic view of performance in practice, and combine this with reflection on performance.





Implementing ePortfolios

Implementing ePortfolios means first of all adopting a common view of learning. Research has shown that adopting an ePortfolio tool without a shared view of learning can lead to disappointing results. National traditions and circumstances are important and should be taken into account. During the ALT-SURF meeting, a number of differences between the UK and the Netherlands were identified.

2.3.1 Differences between the UK and Netherlands

Traditions in educational reform

Firstly, differences in socio-political contexts in both countries have an impact on the goals and perspective people have in mind when discussing the concept and benefits of ePortfolios. One major difference is the position of national government in the process of educational innovation. In the UK the government, through its various agencies, takes the lead in educational innovation by setting goals and timetables for initiatives intended to spur educational innovation. In the Netherlands, innovation is the result of consensus between the various stakeholders involved. As a result, in the UK large scale innovations are directed by the government at specific educational sectors and are implemented in a uniform way, often ignoring the results of similar programmes in other sectors. In the Netherlands, innovations are based on an agreement on a common concept of learning which is translated into a broad range of educational innovations by the institutions themselves, resulting in a kaleidoscope of local models and tools in various schools and universities. Some of these are jewels and some lemons. Compatibility can easily become an issue.

Concepts and practice

Another difference is the strong focus on the conceptual basis of innovation in the UK, whereas the Dutch have a rather pragmatic approach towards educational change. In the Netherlands, common concepts of learning are readily embraced and rapidly translated into practical reforms. In the UK, more stakeholders are involved in the discussions on the conceptual basis of educational reform, resulting in stronger opinions and ownership of the resulting reform.

2.4 Achievements

In the Netherlands a consensus has been achieved among teachers and managers in higher education that ePortfolios offer a means of moving toward a more competency-based and student-centred model of education. Work is focused on achievable goals. Small-scale successes have provided a proof of concept and a basis for institution-wide implementations. Within the Netherlands there is a shared belief that the technology is a means of solving pedagogic problems rather than being an end in itself. There is confidence that this vision is being achieved.

In the UK, government has played an important role in setting a policy agenda, which originally supported the parallel development of paper and electronic 'progress files' in both post16 and higher education. This provides a foundation for current work on ePortfolios. Policy is developed in consultation with practitioners, and a new government policy for England is expected to be announced in October 2004. This will influence policy within the other nations of the UK. It will seek to unify existing practice, using ePortfolios to support lifelong learning across different episodes of education and employment. This strategy, and the funding which comes with it, represents an important achievement.

However, against this changing background, there was perceived to be less consensus in the UK on conceptual issues and a perception that these remain important. Dutch colleagues were sometimes impatient with the English tendency to downplay what had been achieved within the UK.

In both the UK and the Netherlands there have been a number of substantive achievements within Medicine and in particular areas, such as the Building Industry in the UK and Social Science and Teacher Education in Holland. A large pilot in Wales made e-portfolios available to 37,000 students. There are a substantial number of successes of this kind.

A Dutch colleague articulated the general feeling that there is a foundation of solid achievement which would allow both countries to make common cause to ensure that European developments are undertaken within a clear pedagogic context. The proposed Europass ePortfolio service has the potential to build on the good practice that has been pioneered in the UK and the Netherlands.²

2.5 Differences and similarities

Where practice in the Netherlands is concentrated on HE, the UK is concerned to use ePortfolios to develop and unify practice in schools, colleges and universities. All of these constituencies, as well as trade unions, are involved in current UK pilots in this area carried out by JISC as part of the MLEs for Lifelong Learning Programme. This emphasis on lifelong learning reflects the more active intervention of government within the UK.

Perhaps because of this, British colleagues are still looking to develop a shared vision of what should be implemented at the next stage of development. Dutch colleagues are focused on achieving practical institution-wide implementations. Having started from particular situations and concentrated on resolving specific pedagogic problems they are asking how this specific work can be developed to offer generic solutions. There was a consistent Dutch emphasis on involving learners in the development of ePortfolios and on the pedagogy rather than the philosophy.

The approach that Dutch colleagues were taking to the practical implementation of technology to address specific pedagogic issues were consistently accepted by UK colleagues. There is a shared need to develop generic application profiles, which, in a UK context, can unify practice in different sectors and, which in a Dutch context, can provide generic solutions for a whole institution. The need for generic application profiles applicable in a variety of pedagogic contexts is a key point of similarity.

² A formal announcement about this ePortfolio is scheduled to be made in Maastricht in December 2004. It is not yet clear when the Commission's proposal will be submitted to the European Parliament.

2.6 Challenges and collaboration

Approaches to ePortfolios

The workshops revealed a great deal of consensus between the two groups in their beliefs about the broad definitions and roles ePortfolios in higher education. There were, however, some differences in emphasis between the perspectives in the UK and the Netherlands. While these differences represent a challenge for collaboration, addressing these differences also represents a great opportunity to develop a richer approach to ePortfolios. There is greater diversity of practice in the UK compared to the Netherlands, but the UK groups tended to place greater emphasis on personal development planning (PDP) and the need to provide continuity in lifelong learning. The SURF group had addressed these issues to a lesser extent and used different nomenclature (differences in jargon also representing a minor challenge). Both groups recognise the importance of planning (PDP) as part of the ePortfolio process, an area that is not well developed in most existing ePortfolio solutions, where most emphasis is placed on materials and content management. Thus, a key challenge would be to develop efficient ways of incorporating PDP into e-Portfolio practice. A key driver for this in the UK is the requirements for all higher education institutions to support PDP by 2005^v which are based on the recommendations of the Dearing report into HE^{vi}. SURF had a more collaborative approach nationally and the ALT-SURF collaboration would benefit from adopting the positive goal-focussed approach of the Dutch group.

Identifying benefits to ALL stakeholders

A key challenge is to identify potential benefits of ePortfolio approaches to *all* stakeholders. These include learners, teachers, funding bodies, researchers, employers, careers advisors, government, advocacy groups, vendors, developers etc. The potential benefits fall into two areas:

- i) the general benefits of using portfolio approaches - irrespective of the type of media used, and
- ii) 'value-added' features of using IT for portfolios (such as better support for sharing, searching, transferability etc.).

It is also important that these benefits are communicated in a way that each stakeholder group relates to including avoiding use of jargon where possible.

Sharing research and evaluation data

Groups in the Netherlands and UK are engaged in groundbreaking work in developing and applying ePortfolios. A collaborative ALT/SURF approach to sharing research and evaluation data will be important in developing good practice and also in providing evidence of the benefits of ePortfolios to the stakeholders. This may include case studies and systematic research studies for individual institutions and projects, interfacing with existing networks (such as the CRA^{vii} and EIfEL^{viii}), and use of reviews/meta-analyses (such as the EPPI study^{ix}).

Pedagogy

The emerging technologies need to be led by pedagogy (whilst recognising that new technologies may also bring about new pedagogy). There is broad agreement within the ALT-SURF groups on the need to follow student-centred/learner-centred approaches in developing ePortfolios (largely drawing on constructivist ideas). The ePortfolio was seen as a process, which can promote progression to independent learning and encourage a reflective approach to learning, with the learner collecting questions - not just answers. However, there is a need for the group to more clearly define their ideals and identify how closely these relate to current views of stake-holders.

Policy and organisational issues

Related to the pedagogical issues the group faces key challenges in leading cultural change and addressing organisational inertia/resistance. There is a need to encourage student and staff buy-in (including the identification of the benefits of ePortfolios and helping define ePortfolio pedagogy). There may be a need to provide extra support for existing students and staff who are less familiar with the technologies, while new cohorts of teachers and students are increasingly more IT literate. There is a need to address the training, resource, infrastructure, privacy (data protection), legal (eg copyright) implications of ePortfolios.

Design, development and implementation

A challenge for the group is to identify the right balance of personalisation and usability for ePortfolios. Personalisation of the learning environment is a powerful motivator for the learner. Systems also need to be designed with a high degree of usability and support for accessibility. It is also beneficial if the portfolio is

embedded in course design and development, rather than being perceived as a separate bolt-on activity. The experiences of the group can inform on these issues. In designing future technologies there may also be a need to use component-based approaches, such as the Web services model.

Continuity, transferability, and lifelong learning

The group recognises the importance of supporting continuity in learning. ePortfolios in higher education need to recognise both prior learning and support future learning and professional development. Thus, the group needs to use and inform standards and specifications for electronic transfer of ePortfolio information. This will include the standards being developed by IMS^x and related work of the CETIS^{xi} special interest groups.

2.7 Follow-up actions

The following suggestions were made for actions that would build on the collaboration that has been established between SURF and ALT:

- ALT and SURF should share research and evaluation data. This would include research reports and case studies from both projects and institutions, and would be facilitated by the interconnection of existing networks.
- New case studies of ePortfolio use in educational contexts should be compiled from studies in the UK and the Netherlands.
- There are certain fields, such as health education and teacher training, where working together on ePortfolio developments would benefit both parties
- SURF is in the process of establishing a Portfolio Special Interest Group in the Netherlands. Were a similar group to be established in the UK (by CETIS or ALT) the two groups working together could provide the vehicle for further collaboration.
- Create a register of ePortfolio experts.
- Organise more joint meetings (also including CETIS and the SURF SIX group, concerned with metadata and standards).
- Prepare and maintain a list of conferences and other events in the UK and the Netherlands on ePortfolios.
- Establish a collaboration workspace.
- Examine opportunities for outside funding, without which many of the above activities will be hard to progress.

3 Digital Repositories briefing paper

3.1 Working group participants

Netherlands:

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Rachel Ellaway, Hilary Grierson, Allison Littlejohn,
Sarah McConnell, Lou McGill, David Nicol, Steve Rogers, Sue Timmis

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Jim Martino

Paper prepared by:

David Nicol, University of Strathclyde (d.j.nicol@strath.ac.uk).

3.2 Introduction

This briefing paper presents perspectives on the current state of developments in the use of digital repositories in higher education in the UK and the Netherlands. The paper is the output of a two-day ALT-SURF event held in Edinburgh on 21st/22nd April 2004. The participants at the event were those involved in, or interested in, digital repository development, research and use in the Netherlands and the UK. There was also one participant from the US. The event was organised to try to reach some agreement about what digital repositories are, what beliefs exist about repositories in the Netherlands and the UK and what the major challenges are and how these challenges might be addressed. There was also interest in exploring possible collaborations amongst participants from the Netherlands and the UK that might help take developments forward.

Definitions

At the beginning of the discussion there was little agreement about how to define a digital repository across the community of practitioners who participated in the ALT-SURF event. However, the core idea that emerged from this group, at this event, was that a repository is 'a content store of digital objects with meta-data'. Repositories can be used to store, manage, expose, deliver and reuse digital resources within and across networked environments. There are many other definitions of the term 'digital repository'; for example, a technical definition is provided IMS¹. In education, the important questions are: What is the digital repository used for? What services are provided for the user? And within what digital environment is the repository located? Digital repositories are a core element in many other educational systems (e.g. libraries, ePortfolios, shared workspaces, virtual learning environments) and this might amplify the range of services. The services provided by a repository might differ depending on who is using the repository and the task in hand. [Note that this definition of services refers to 'services provided to the end-user' which is at a higher level than machine services that are common to all repositories]

At a broad level, the purpose of a repository is to support a community with shared interests. From this perspective, a repository is defined by how the community uses and interacts with it. In teaching and learning, the services associated with the repository should be aimed not just at delivering content to users but also at enabling users to construct knowledge. Repositories have a role in supporting many other communities both local and remote such as a faculty community within an institution or research or disciplinary communities within and across institutions. Communities can, however, be tightly knit (e.g. a group work-

¹ IMS Digital Repositories Interoperability - Core Functions Information Model (2003).
http://www.imsglobal.org/digitalrepositories/driv1p0/imsdri_infov1p0.html

ing on the same project) and loosely knit (e.g. all those who might access resources in a national repository of engineering resources) and this might influence how access rights to resources are managed.

3.3 Reasons for interest

There are a number of reasons why stakeholders in the higher and further education sectors are interested in digital repositories. Foremost amongst these reasons is that repositories have potential to support the learning process. For example, students can benefit from flexibility of access to learning materials made possible through digital repositories and from the ability to store versions of their own work (e.g. during collaborative writing). Teachers, or groups of teachers, can use digital repositories as a way of accessing a wide range of curriculum resources and as a way of building and managing databanks of their own teaching resources. From a practical viewpoint digital repositories are also seen as a way of saving teacher time in preparing courses and of increasing the quality of teaching materials and instructional approaches (e.g. they might source learning designs from repositories). Librarians are also interested in using repositories to facilitate academics' and students' access to a rich set of learning resources. A particular concern here is to ensure the coherence of metadata and connectivity across systems so that users can search for relevant resources and have them delivered with minimum effort.

Digital repositories are also thought to afford benefits at the institutional and inter-institutional level. Senior managers envisage digital repositories as a way of preserving and reusing digital assets and of achieving a return on investment in creating these assets. Indeed, in future such assets might (and perhaps should) be recorded on institutional balance sheets. For governments, digital repositories offer the potential for economies of scale in resources development and use across educational institutions. Their interest might be in maintaining quality while improving the cost-benefit return on investments in resources development.

3.4 Beliefs about digital repositories in the UK and the Netherlands

Beliefs about digital repositories in the Netherlands and the UK were surprisingly similar. This was, in part, due to the shared belief that a digital repository is essentially a store for digital objects with metadata. In general, differences in beliefs reflect more the different ways in which repositories are currently being used than in the nature of the repository itself. For example, institutions might have different uses for repositories (e.g. to share resources internally or with other institutions) as might different education sectors (further education or higher education). There might also be significant disciplinary differences in the way digital repositories are viewed and used, for example, in the social sciences (to support debate, argument and the solving of open ended problems) and in sciences (to support the acquisition of facts, the visualisation of complex processes, to share test banks of assessment items etc.). In terms of services the core beliefs behind digital repositories were: making resources accessible; sharing, reusing and brokerage of resources; supporting learning and teaching; supporting communities of practice; managing institutional investment; preserving digital assets.

The main differences between the Netherlands and the UK is in the way that government policy and strategies for higher and further education sectors are supporting and influencing developments in digital repositories. The UK government is adopting a more interventionist approach than the Dutch government and is directing developments using funding as a lever. The government in the UK has funded large repository collections such as JORUM+ (a national learning object repository), the Higher Levels Skills for Industry (HLSI) repository (Yorkshire Forward regional development agency) and Stør Cùram (a repository of learning resources for Social Care) and it is funding a range of middleware initiatives through JISC programmes. One of the aims of these projects is to ensure that repositories can inter-operate with each other and with other networked systems (e.g. libraries, VLEs). UKOLN and CETIS are two advisory services that support these UK initiatives. Legislation is also a powerful driver in the UK with 'accessibility' requirements influencing access and formats for digital resources (Special Educational Needs Disability Act, 2001). The UK government, mainly in relation to JISC-funded projects, also has procedures for careful monitoring of spending on projects and for supporting systematic evaluation studies.

The Dutch government has a less interventionist approach to developments in digital repositories. It still provides funding but it does not closely monitor the spending of money or the outputs of each project from a strict return on investment perspective. In the Netherlands there is greater opportunity for students to

access digital repositories as most students have broadband access even from home. There has been less focus in the Netherlands on middleware development to date. In the Netherlands discussions have only recently turned to the 'services' that repositories provide for users although there has been a focus on repositories for some specific practical uses such as assessment item banks and digital portfolio developments. However, some people think that developers are still too focused on services in traditional contexts rather than 'visioning' new end-user services.

A number of Dutch universities are implementing repositories, often as part of their cooperation with consortia like the Dutch Digital University or the E-merge consortium. The SURF Foundation facilitates repository related developments through the SURF DARE (Digital Academic REpositories) programme and from an interoperability point of view through the SURF SiX expert group.

The overall consensus within this ALT-SURF group was that stakeholders in each country are still thinking in traditional ways about digital repositories and that this is hampering developments. Technology is still the driving force rather than what services repositories might offer and how these services might support new modes of teaching and learning and new ways of working with resources. There was agreement that new thinking about repositories is needed and that this will require a re-evaluation of the processes (organisational), structures (e.g. libraries) and the ways of doing things (management) in institutions.

3.5 What has been achieved?

In the Netherlands many digital repositories are being developed but that these systems so far only offer limited functionality in relation to the services available. Moreover, many of these repositories are used to support research (e.g. the DARE, Digital Academic REpositories – initiative of SURF) rather than teaching and learning. In the Netherlands, 'people are still talking about systems but not many projects focus on real life usages and scenarios, for example, with students'. The full value of investment in digital repositories will only be realised when the 'services to users' issues are addressed. In 2003 the emphasis in DARE was on technical implementation of OAI compliant repositories but in 2004 the emphasis has shifted to the development of services and the involvement of researchers and teachers.

In the UK a great deal of effort has gone into building tools and digital content repositories, but usage by the wider community has been hampered by social and cultural issues. One reason for the focus on systems rather than services in both countries was that it is easy to see the output of system development whereas the output in terms of effective usage takes much more time to realise.

Both in the Netherlands and the UK, a further difficulty is that 'it is quite hard to envision the end goal - what the full range of intended usages for digital repositories might be'. There is therefore a need for a continuous focus on trying to 'vision where we are going'. Obstacles to take up of digital repositories include lack of understanding by users of the potential benefits of digital repositories, lack of available scientific evidence that digital repositories provide real benefits to end users (e.g. to teachers and learners) and technical difficulties (e.g. in setting up repositories in local situations).

3.6 Challenges and Issues

The challenges raised by digital repositories are wide ranging - from technology to human factors within and across institutions. However the technology challenges are considered much more easy to resolve than the educational, management, cultural and social challenges raised by the use of digital repositories. The following is a list of the challenges identified by the ALT-SURF group.

How do we conceptualise digital repositories? (services, paradigms, systems)

As noted above, the value of digital repositories is in the *services* they provide to users with these services differing depending on the user. One way of thinking about services is to think of them in relation to user roles - students, teachers, librarians, support staff, researchers - with different uses depending on roles. However, this might be an unproductive approach given that the same person or group of people might use the same repository quite differently depending on the task in hand (e.g. students might share resources in a repository when working in groups but might not wish to share resources created for assessment; researchers might not wish to share commercially confidential material or pre-publication findings whereas wide

dissemination might be desirable at post-publication stage). This suggests that it might be more productive to consider the *purposes* of the repository within an educational context rather than the user group.

Another issue in educational contexts concerns the learning *paradigms* underlying the use of repositories. During learning, repositories can serve to support the student's acquisition of content resources or, with a different set of attached services, it could support the construction of knowledge by learners or the self-management of their learning. Hence, a key issue is how repositories are conceptualised within different educational contexts of use. A third conceptualization concerns how repositories are thought of in relation to other *systems*. Digital repositories will often be a part of or linked to other *systems* (e.g. virtual learning environments, shared workspaces) and will therefore have added services. Thinking of repositories in isolation from the wider information environment will diminish their potential.

How do we keep the focus on educational uses of repositories and not the technological issues?

There is concern that technology is often the driver for repository developments rather than the uses to which that technology might be put. The focus on 'uses' rather than technology will require participation by a wider community in development work in digital repositories, research that is focused on technology in contexts of use rather than in isolation, and greater attention than in the past to organisational and cultural drivers in institutions and across institutions. These are elaborated upon below.

How do we get teachers to contribute to and to make use of digital repositories?

If learning object repositories are to support teaching and learning activities, teachers must contribute learning resources to repositories and make use of those contributed by others. However, there are significant barriers to be overcome in terms of sharing of resources such as educational materials (learning objects) within and across institutions. Producing materials with a view to sharing would require teachers and institutions to work in ways quite different from current practice. For example, if teachers were to produce learning content for repositories they would have to plan for sharing and re-use. But this raises complex issues about the granular size of learning objects, about preservation of the context of learning object use, about allocation of roles and staff time, and about institutional recognition and rewards. Other models are possible, for example, where external suppliers create content and teachers use it, but this would be just as challenging to implement (e.g. teachers often prefer to use their own materials rather than reuse material developed by others).

Teachers will only be convinced about the value of repositories, if they are seen to be solving real problems, adding value or saving them time. In addition, for effective uptake of a learning object economy using digital repositories, more resources will have to be invested in awareness raising (about the added value through repository use) and in support and preparation in using repositories (through staff development programmes). A starting point might be to build on current practice by emphasizing 'usability'. Usability is important even in current practice because teachers deliver the same course over and over again but with updated content. Sharing might also be attractive if teachers can adapt materials in learning object repositories and add or subtract other material and access information about how others have used learning objects educationally. Whatever the approach, progress will depend on being clear about why academics might want to contribute and share resources in repositories.

How do we provide proof of the benefits of digital repositories?

There is insufficient research showing the benefits of repositories and this is hampering progress - this includes research on benefits to students, teachers and the institution as a whole, and for groups of institutions. There are few studies showing how learning might be improved through the use of repositories or how teachers might save time or how repositories will result in economies of scale. There is also little research on the use of repositories in real classroom situations. Another problem with large repositories is that, users (especially students) require considerable preparation and support to learn how to access and use them effectively (e.g. search skills and information literacy). Therefore disentangling the value of the repository from its context of use is problematic. There is, therefore, a need for better research on process and user variables in order to avoid having a large number of empty repositories in the future.

These studies should involve an appropriate cross-section of stakeholders and address a range of questions from the classroom level through to the institutional and cross-institutional costs and benefits.

How do we encourage change in higher education so as to benefit from digital repositories?

In order to realize the full benefits from digital repositories and a learning object economy, the way an institution functions and its relationship to other institutions and agencies will need to change significantly. To many in the ALT-SURF group this was *the* most important challenge to the HE sectors in both countries.

The use of digital repositories in teaching and learning demands changes across a range of institutional processes and in the social culture of the institution. Staff and students will need to develop new skills (technical, information literacy, learning skills) to benefit from repositories. Much greater coordination (than in the past) will be required across academic, support and administrative staff if digital repositories are applied at department, faculty or institutional level. Individual roles and responsibilities will change (e.g. librarians) and new roles will emerge as repositories become embedded in organizational systems. New management processes will be required in teaching (e.g. to deal with quality processes for digital resources and legislation) and in financial and budgetary control (e.g. to manage institutional assets in repositories). Knowledge management procedures in institutions will also change as teaching, research and administrative processes are all supported through interlinked digital repositories and associated services.

These developments raise other important questions: How will the benefits of digital repositories be maximised across this range of diverse stakeholders? What business models are best used to capitalize on digital assets? How will institutions reward innovation in the use of digital repositories in teaching and learning?

How do we align government policies and funding so that developments in digital repositories meet the needs of higher education?

Digital repositories are not the driving force for change. Instead it is the desire to facilitate teaching and learning and the implementation of lifelong learning. Hence governments should fund projects directed at changing educational processes supported by technology rather than just technology projects. These projects should also address a combination of factors together rather than a single factor. An example cited was a project that simultaneously dealt with 'processes, people and culture', with 'technology, products and services' and with 'management and organisation'. A recent initiative in Scotland also exemplifies this approach. The joint funding councils for further education and higher education have recently offered institutions money to engage in strategic transformational change supported by e-learning. Institutions bidding for this money have to show that what they will do is aligned with their own long-term strategy for e-learning, that there will be embedding of new processes in the institution, and that there will be quality improvements in learning or cost-benefits deriving from the implementation. Similar requirements to demonstrate embedding are being made in the Netherlands when institutions bid for SURF funding for e-learning projects.

How do we agree conditions of use (and reuse) of digital repositories within and across communities?

One of the significant barriers to the use of repositories, once established, is agreeing on conditions of use. Those who contribute resources to repositories don't necessarily wish completely free access and use by others. Rather it will be necessary for contributors to have choices - for example free exploration and use; free use but the originator must be credited; free modification; share alike (i.e. pass on to others under the same conditions as you received). All this is part of the management of digital rights. Widespread use of repositories will depend on contributors and users having confidence that their rights are properly managed. In effect, digital rights management needs to be flexible enough so that contributors and users can express rights. The situation is complicated by the need to aggregate rights and the fact that conditions of rights might need to change over time (e.g. rights might be revoked or licenses might expire). If the higher education institution were the owner of the rights then the rights issue might be resolved at that level. However, in reality, there are many levels of ownership and many people involved. This will make rights management more problematic.

How do we determine the roles of different stakeholders in repository development, including metadata?

The main question here is 'who takes responsibility for organising, evaluating, selecting, cataloguing (applying metadata), indexing resources?' This might differ depending on the project in question. For small collaborative projects this might be shared across staff, students and librarian. But in a larger project librarians might occupy a key role.

How do we capitalise on the skills of the librarians?

Librarians have expertise required in managing digital collections and in providing user support services. However, new developments such as peer-to-peer sharing and the widespread development of digital repositories are raising new issues in relation to the librarians' role. The librarians in this ALT-SURF group felt that the challenge was 'to transform traditional professional practice of librarians in collection development, metadata workflow and management and information literacy education so as to continue to enhance the learning process'. This group believes that it is important that their expertise in this area is drawn on during repository developments so that 'wheels were not endlessly reinvented'.

How do we personalise digital repositories to fit user needs?

There is strong support for the idea of personalisation of repositories, in the sense that access to resources and the way resources are delivered should fit user needs and ways of working. Different ways of achieving this were discussed such as a web portal approach and a service oriented information architecture so that all systems can be unified and work together. To achieve personalisation more work will have to be done on conceptualising the workflow processes of students, teachers and researchers.

How do we ensure interoperability and standards?

The purpose of a repository is to support a community but people belong to multiple communities so they need to use multiple repositories often within the same task. There should be seamless connectivity across repositories or some method of 'making the walls between repositories invisible to the user'. Users should also be able to move easily from repositories to other systems such as virtual and managed learning environments and library systems. If there were a lot of duplication of resources in libraries and in repositories this might not be cost-effective.

Another issue is how repositories developed for one purpose (e.g. to share research materials, publications) might be integrated with repositories developed for other purposes (e.g. to share learning objects). This can be achieved by integrating the functionalities into a single system, or by building loosely coupled systems interconnected by interoperability standards and specifications. In this context, there is a need to study how the different metadata standards like Dublin Core and Learning Object Metadata might be reconciled.

How do we approach the development of digital repositories?

It has been argued that developers should not be trying to develop monolithic systems like Management Information systems (MIS), library systems, Virtual Learning Environments (VLEs). It is better to develop simple component systems that interoperate and share services (the message was keep it simple). This would avoid the duplication of functionalities and allow the development of more complex but connected systems. However, others maintain that this approach is problematic, might not be scalable and that there is a need to plan for the long term. This highlights a perceived tension between tailoring systems to meet local user needs and standardisation to ensure interoperability for global needs and long term economies.

How can repositories be used to empower the learner?

In education, it is normally the teacher who makes decisions, and, to a large extent, controls the use of learning resources by students. Yet, most educators would like to see a move towards greater learner self-regulation with learners having greater control over resources and their use. Digital repositories might contribute to this change of focus from teacher-centred to learner-centred education. They can facilitate the sharing of resources across diverse communities and unrestricted access to learning resources. It is important therefore that repositories are not just adapted to suit current, and dominant paradigms of learning. Instead, they should be harnessed to support self-regulated and lifelong learning approaches with resources accessible in a way that is flexible and can be tailored to different learners' needs. Taking this wider perspective, members of the ALT-SURF group wished that digital repositories were used as 'instruments to create a better world'.

3.7 Collaboration

At the end of the two-day ALT-SURF event some suggestions were made both about how participants from the Netherlands and the UK might collaborate and about future activities to take developments forward:

- Case studies of repository use in educational contexts should be compiled from studies in the Netherlands and the UK. These should look at the services surrounding the use of repositories.
- Charles Duncan and Allison Littlejohn to develop template for case studies and Martin Feijen, Rachel Ellaway and Eline Noorbergen to supply case studies for repositories. Freddy Veltman (Rotterdam Polytechnic should be asked for a case study.
- The CETIS pedagogy forum should be a vehicle for support and discussion around educational uses of repositories.
- Some joint meetings should be arranged with ALT-SURF group, the SURF SiX group and the CETIS, Metadata and Digital Repositories SIG and the Assessment SIG.
- Create a network of digital repository librarians. The librarians suggested that a network of digital repository librarians be formed because:
 - (1) they are often working in isolation from other librarians
 - (2) they could share information about good practice and about how to share library ideas with other professionals
 - (3) they could begin to offer staff development to other librarians involved in repository developments and to drive change within the library profession.
- A TikiWiki repository/shared workspace should be set up to make collaboration across members of the ALT-SURF group easier.
- Evaluative Action Research projects should be encouraged to provide more evidence of the classroom benefits of digital repositories. For example, researchers and teachers might look at disciplinary differences in the way repositories are used.
- JISC-SURF funding should be sought for collaborative projects.

4 References

Chapter 2

- ⁱ Shulman, L. (1998). Teacher portfolios: a theoretical activity. In N. Lyons (Ed.), *With portfolio in hand: validating the new teacher professionalism*. New York: Teachers College Press.
- ⁱⁱ Driessen, E.W., Vleuten, C.P.M. van der, Schuwirth, L. & Tartwijk, J. van, Vermunt, J.D. & (accepted for publication). *Credibility of portfolio assessment as an alternative for reliability evaluation: a case study*. Medical Education.
- ⁱⁱⁱ Tartwijk, J. van, Driessen, E., Hoebregts, B., Kösters, J., Ritzen, M., Stokking, K. & Vleuten, C. van der (2003). *Working with an electronic portfolio* (in Dutch: *Werken met een elektronisch portfolio*). Groningen, Wolters Noordhoff. See <http://portfolio.uu.nl/SURF-Efolio/Handboek/Index.htm>
- ^{iv} See <http://www.qwiki.info/projects/Europortfolio/epicc>
- ^v Guidelines for HE Progress Files, Quality Assurance Agency for Higher education, 2001. <http://www.qaa.ac.uk/crntwork/progfileHE/guidelines/progfile2001.pdf>
- ^{vi} NCIHE 1997 Higher education in the Learning Society. Report of the National Committee of Inquiry into higher education HMSO 2 vols
- ^{vii} Centre for Recording Achievement: <http://www.recordingachievement.org>
- ^{viii} See <http://www.eife-l.org>
- ^{ix} The effectiveness of personal development planning for improving student learning. A systematic map and synthesis review of the effectiveness of personal development planning for improving student learning. EPPI-Centre 2003. http://eppi.ioe.ac.uk/EPPIWeb/home.aspx?page=/reel/review_groups/EPPI/LTSN/LTSN_intro.htm
- ^x IMS Global Learning Consortium, Inc: <http://www.imsproject.org>
- ^{xi} Centre for Educational Technology Interoperability Standards (CETIS): <http://www.cetis.ac.uk>

Chapter 3

ALT	http://www.alt.ac.uk
SURF Foundation	http://www.surf.nl/en
CETIS	http://www.cetis.ac.uk
SURF SiX	http://e-learning.surf.nl/SiX/english
JORUM+	http://www.jorum.ac.uk
HLSI repository	http://www.hlsi.org.uk
Stør Cùram	http://storcuram.blogs.com
UKOLN	http://www.ukoln.ac.uk
Special Educational Needs Disability Act	http://www.hmso.gov.uk/acts/acts2001/20010010.htm
SURF DARE programme (in Dutch)	http://www.surf.nl/dare
The Dutch Digital University	http://www.du.nl
E-merge consortium (in Dutch)	http://www.e-mergeconsortium.nl