Reflective learning, future thinking: digital repositories, e-portfolios, informal learning and ubiquitous computing

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Contents

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[2] see Annex 1

Introduction

Learning technology is being driven rapidly onward by many forces: pedagogic, financial, political, technical, and cultural. We believe that three themes represent the key directions for learning technology development:

- digital repositories, or large-scale institutional content management systems, learning object content management systems, repositories of research outputs, and similar
- e-portfolios, which might be seen as personal learning object management systems, or personal repositories of e-portfolio items, and the individual representations or presentations made from e-portfolio items
- ubiquitous computing, from simple ready access to personal Internet connectivity ranging through adaptive, personalised, location-aware smart environments, virtual presence and ambient computing.

The shape of the educational world, already transformed in many developed countries by information and communication technologies (ICTs) and learning technologies such as virtual learning environments (VLEs) or learning management systems (LMS) and computer aided assessment (CAA) will be even more radically transformed as repositories, e-portfolios and ubiquitous computing find real expression and application.

This paper summarises the results of the Reflective Learning, Future Thinking research seminar jointly held by ALT, SURF and ILTA at Trinity College Dublin. At this seminar 50 leading researchers from three nations came together to share thoughts about the direction of learning technology development.

Summary

At the heart of all three discussions we still see concerns about status and valorisation of knowledge, disciplines and roles. Repository discussions touch on quality and gate keeping, portfolio discussions touch on the ownership of identity as a learner, while ubiquitous computing and informal learning touches on fundamental questions of access and learner control. For all three themes we might conclude that:

- Centripetal, national agencies and large institutions tend to drive innovation in the UK; in the Netherlands the tendency is more centrifugal: innovative practice is driven by groups within institutions through a collaborative approach; in Ireland, innovation has been atomic, being driven principally by pioneering practitioners, but is beginning to adopt a more collaborative approach.
- Functionality today will appear limited within two or three years and future functionality will probably have been unanticipated
- Implementations will initially be educator/developer-centred rather than learner centred because of policy and funding regimes; this is, perhaps the biggest challenge.
- Disaggregation of components and support for repository, e-portfolio and ubiquitous informal systems is necessary; central units supporting monolithic systems are unlikely to have the flexibility to respond to future needs.

Repositories

- The bottom-up approach was proving to be very successful and indeed called into question the need for a single institutional-wide (or national) repository, as opposed to community based systems
- Any repository would need to be interoperable with other systems, and should sit outside of any VLE
- Metadata was often seen as the main problem
- Process and strategy is possibly more important than the content itself, and the focus should be on the context rather than content
- A repository could be an uncontrolled system to begin with, allowing anyone to deposit anything; such openness may be an anathema to some as it abandons all attempts to control the system, but it was suggested that such an approach could greatly facilitate short term uptake.

e-Portfolios
- Portfolios appear to represent a move toward learner-centred, self-directed, peer-to-peer, autonomous learning; we are all learners
- Portfolios can help people to define their own success both in line with and in opposition to normalising centralised tendencies
- There are tensions between a process-focussed developmental/formative approach and a product-focussed summative approach; should reflection be assessed?
- e-Portfolio processes involve learning new skills such as concept mapping and making visual connections; portfolio literacy is a part of a wider requirement for digital literacy
- A multi-disciplinary approach is essential; this requires novel partnerships and challenges conventional practice

Ubiquitous computing and informal learning
- people are now averaging about 15 hours a week on informal learning activities yet very little of this informal learning is supported by e-learning or ubiquitous computing
- the central themes of ubiquitous computing is the interconnection of the devices to support user goals or activities
- Ubiquitous computing and computing devices challenge the control of the tutor and put more control in the hands of the learner
- Truly ubiquitous computing is long way off; adaptive devices (wireless / mobile) are here now
- Informal learning may harness ubiquitous computing environments of the future by provide 'learning services' to people in formal, non-formal and informal learning settings, and by helping people to manage their personal learning goals, projects and informal learning activities
- There are big trust issue in ubiquitous computing; convenience can sometimes overcome the trust issue
- If ubiquitous computing is to be a friend it is necessary to not focus on technology but on learning needs.

Digital Repositories and Reusing Objects

Introduction
The ALT/SURF white paper (ALT/Surf, 2004) provides an excellent summary of issues surrounding digital repositories. In this workshop the concentration was on three aspects:
- updating participants and exchanging information on recent developments since the production of the white paper
- moving the discussion to looking at some further technical issues of the deployment of a digital repository, and the political issues surrounding use and reuse
- providing suggestions for future collaborative initiatives between SURF/ALT/ILTA.

Recent Developments in Repositories
In all three countries, the Netherlands, the UK, and the Republic of Ireland, there had been considerable progress in terms of both national and local repository initiatives. In the Netherlands there had been the successful 'Cream of Science' initiative under the DARE programme (http://www.darenet.nl) which successfully created a repository of publications and notes emanating from over 200 of the top scientists in Holland. In addition they had just launched LOREnet project (to create a network of learning object repositories). In the UK the JISC were funding a major digital repositories initiative to explore a range of technologies across personal, local, and national repositories (http://www.jisc.ac.uk) and in August 2005 JORUM was due to be launched (http://www.jorum.ac.uk). JISC also commissioned a published a review of repositories by Anderson and Heery[3] which provides a good summary of the state of play. In Ireland also a new learning object repository was being launched at a national level. Elsewhere work was progressing in the standards area through OAI-PMH, as

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[3] www.jisc.ac.uk/uploaded_documents/rep-review-final-20050220.pdf

well as Dublin Core, IEEE-LOM, and MPEG21-DIDL (as always it is worth looking at the summaries posted on the CETIS web site about these initiatives – http://www.cetis.ac.uk). Mention was also made of the CORDRA project (http://cordra.lsal.cmu.edu/cordra/).

Discussion

Participants in the workshop were invited to discuss a series of challenges around two main themes:
- the structural/technical issues surrounding the use of repositories
- the cultural problems.

Overwhelmingly the participants were from a Higher Education background which gave common ground for discussion. Most described themselves as being at the 'exploratory' stage, i.e. their roll-out of a repository was very early on, and the cross-University discussions were only just beginning.

Factors which initiated the discussions as to whether a repository was needed were mainly funding (which provided an initial impetus) but also the sense of small community repositories appearing in departments, or cross-institutions based on subject areas.

It was agreed that the bottom-up approach was proving to be very successful and indeed called into question the need for a single institutional-wide (or national) repository, as opposed to community based systems which would have buy-in from academics, and could be searched on a federated basis.

Other issues which emerged early on were granularity, type of content that was applicable, and access rights. It was recognised that any repository would need to be interoperable with other systems, and should sit outside of any VLE. It should be flexible, easy to use, and robust. Metadata was often seen as the main problem. On the one hand it was suggested that DC was too simple for most people's wishes, yet IEEE-LOM was too verbose. Yet at the same time different stakeholders would have different perspectives on what was essential and what was not (e.g. archivists versus academics).

The products which had been looked at were well-known: DSpace, Fedora, Intralibrary, TikiWiki, Hive (Livelink), etc., but they also included specialised image repository systems, and the occasional home-grown product.

Discussion then moved to the cultural issues surrounding the use of repositories. It was recognised that in HE we are mainly dealing with an untrained workforce who did not understand the advantages or complexities of such things as repositories. In particular it was noted that a repository is only as good as the content that is in it, but how can you persuade content holders (e.g. academics) to deposit good quality material in there that is usable and reusable. The Cream of Science project appealed to the status of academics and presents one solution (e.g. depositing increases one's profile), and other incentives proposed were: payment (i.e. for content deposited); focusing on the processes academics underwent to demonstrate how a repository could assist; show how a system could help them to manage their research outputs, or research profiles; or to help them if they are suddenly asked to teach a course (i.e. can quickly find good teaching material). In summary a repository system needs to appeal to the needs of its users[4]. Process and strategy is possibly more important than the content itself, and the focus should be on the context rather than content. A repository also needs to be seamless, and ubiquitous.

It was also recognised that we should not just focus on teachers. Learners' needs should also be looked at. They could be given spaces in repositories to deposit material, and collate their work. However it was suggested that this would need some way of distinguishing student material from quality assessed teaching material. (The e-portfolio strand also noted the similarities between repositories of e-portfolio items and learning objects.)

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[4] A more draconian measure discussed was to suggest inserting a clause into employment contracts stating material needed to be deposited centrally.

Again the topic of metadata appeared: namely who should be responsible for creating it? It was recognised that the content creator (e.g. the academic) would always need to create some, but information specialists/librarians should be brought in.

The idea was mooted that a repository could be an uncontrolled system to begin with, allowing anyone to deposit anything. This complete openness may be an anathema to archivists and cataloguers as it abandons all attempts to control the system, but it was suggested that such an approach could greatly facilitate short term uptake.

In favour of this approach were the points:
- It reflects practical point of view, even if it does fly against accepted wisdom of control; but this reflects real life and real structures in Universities
- we have nothing to build on, we have never had a shared repository, we do not share, so we have to be open
- it is impossible to create a community of practice, so we need to put conditions in place to allow a CoP to grow and flourish
- we overstate the problems of digital rights – risks are minimal but have to be taken
- we don't know what digital repositories are like because for learning materials they don't exist – therefore we need to experiment
- self-policing and self-regulating would work and often are the best forms of control
- this would be based on trust which is attractive to many users

Against this approach were the following comments:
- what would the difference be between a repository and a filestore?
- This would be akin to a library with no catalogue, where anyone can add any book, eventually unusable – just a random collection of books
- Nobody is above the law – disorganised repository would leave us culpable to users depositing illegal material
- repositories are there to support education and practice so we do need structure – if metadata is imprecise or inaccurate it will be rejected by the community
- what is the benefit of repository over web if it is not grouped, themed, or structured
- structure facilitates the building of educational process and practice, otherwise it is just a random collection of content
- we should learn from the past – we have honed and tuned libraries and we should remember how they function

Future Initiatives

In the final session of the workshop possible follow-up activities were discussed. It was agreed that:
- the group should investigate a project proposal for a digital repository project under EC Framework VI (Owen and Valery would take this up)
- user engagement is necessary (ALT would take this up)
- Synthesizing of the JISC call
- The group needs an email list for exchange of info and to stay in contact (Mike Weaver would take the lead)
- The group would try to meet again during ALT-C in September in Manchester

e-Portfolios

Introduction

e-Portfolios are one means by which governments are seeking to build knowledge economies. The British Department for Education and Skills (2005) assert that they seek to "Provide integrated e-portfolios [for Schools] by 2007" and to provide, "A personalised learning space, with the potential to support e-portfolios available within every college by

2007-08" (DfES, 2005).[5] As part of the process involved in the establishment of a National Framework of Qualifications in Ireland, Léargas[6] recommended that the National Qualifications Authority of Ireland consider the portfolio system, being developed by the European Commission, as a method for lifelong learners to demonstrate their formal and informal qualifications and competence. In Dutch institutions of higher education digital portfolios continue to attract increasing interest[7]. This can be explained partly by the focus on competence-oriented education in professional/technical universities, and also by academic universities' attention to fostering academic maturity.

Institutions and practitioners also have reasons of their own for developing e-Portfolio systems. Among these we find:
- reducing contact time while also increasing the quality of contact time
- increasing learner autonomy and self-direction,
- stimulating reflection and deep learning
- helping lifelong learning
- facilitating progression of learners within and between institutions and between national education systems, often in novel partnership arrangements.

This strand of the seminar looked first at learning and learners, then at e-portfolio processes and finally at e-portfolio implementation.

e-Portfolios

Portfolios are collections of objects that attest to claims. According to Richardson and Ward (2005):

> The term portfolio as used in the UK generally describes a collection (or archive) of reflective writing and associated evidence, which documents learning and which a learner may draw upon to present her/his learning and achievements.

However, it is important to note that the term "e-portfolio" is not fixed. Generally, e-portfolios are discussed in three ways: e-portfolio items, e-portfolio systems and e-portfolio presentations (see Grant 2005 for a detailed discussion). e-Portfolio items are, like "learning objects": anything that might be stored or referenced in an e-portfolio system. Emerging standards[8] recognise certain key types of e-portfolio items. An e-portfolio system is a collection of tools that allows various operations to be performed with e-portfolio items, for example: uploading products to a file store, entering reflective statements, and making presentations. e-Portfolio systems might be proprietary or open source, they might be web-based or they might stand alone on a users PC. For a comprehensive review of e-portfolio systems see Richardson and Ward (2005). Finally, e-portfolio presentations are "assemblies" or "collections" of e-portfolio items made for a purpose such as demonstrating competence in a field. These might be made to be read on line like a personal website or produced as print-based output.

To keep matters confused, the simple term "e-portfolio" might be used synonymously with either "system" or "presentation". As Grant (2005) observes, "there is still the unfortunate risk of ambiguity between on the one hand the presentation, and on the other hand the system which manages that presentation".

Learning and the learner: reflection and representation of identity

Portfolios appear to represent a move toward learner-centred, self-directed, peer-to-peer, autonomous learning (Van Tartwijk, Driessen et.al 2003). Reflective learning and reflective practice have been hallmarks of professionally-oriented learning in many fields. It is now

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[5] See also: HEFCE, 2005; BECTA/JISC, 2004; CareersWales (http://www.careerswales.com/default.asp); EIfEL, 2004; Learning Improvement Forum (LIfIA, 2004 http://www.lifia.ca/en/info_about.htm)
[6] Léargas is Ireland's National Agency for the management of transnational programmes in the areas of Youth Work, Primary and Secondary Education, Vocational Education and Training, and LifeLong Learning.
[7] See http://www.surf.nl/portfolio for NL Portfolio, the special interest group on e-portfolio's in Dutch Higher Education.
[8] There are two main standards: IMS e-Portfolio (http://www.imsglobal.org/ep/, accessed 01 August 2005) and IMS Learner Information Package - LIP (http://www.imsglobal.org/profiles/index.cfm, accessed 01 August 2005) and its British counterpart BS 8788-3, UK Lifelong Learning Profile (UKLeaP) PART 3, UKLeaP Specification.

recognised that portfolios can be an aid to reflective learning and that reflection has value across the disciplines as a means of developing transferable skills.

Another direction of inquiry has to do with the meaning of success in society; how can success be measured? How does success differ from person to person and in different contexts? What constitutes success for society more widely? Portfolios can help people to define their own success through reflection with evidence often enhanced with peer or mentor commentary. Portfolios also make explicit and facilitate the representation of identity. Identity can concern the problem of associating an i.d. with an individual and then associating that i.d. (name, number) with data. Identity also concerns things like: gender, age, ethnicity, vocation, class, embodiment, pleasure, communities, family, religion and so on; who am I, really? But portfolios can also be used for objective testing and measuring individuals against external competency profiles, valorising socially or politically determined factors of success and identity. This leads to tensions between a process-focussed approach and a product-focussed approach; should reflection be assessed?

e-Portfolio Processes

The portfolio cycle resembles the familiar Kolb learning cycle. There are four stages: orientation, selection, reflection, representation.
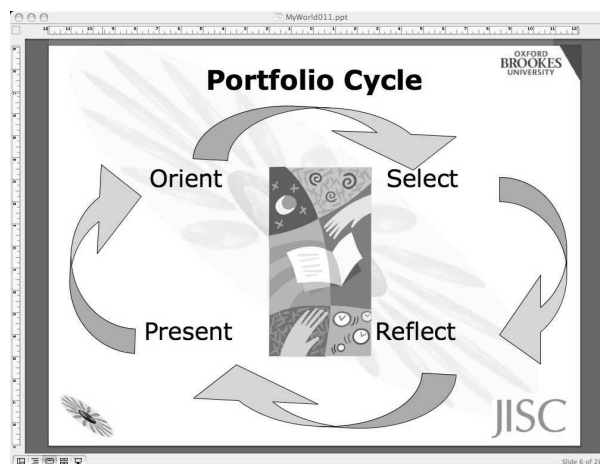

Figure 1: Portfolio cycle

When a learner engages with an e-portfolio they do so with an orientation. The orientation will determine the selection of artefacts to be included in the portfolio. Having selected artefacts **in** to the system and reflected upon them, the learner then selects them **out** of the system, that is, they make a presentation using a subset of the artefacts.

e-Portfolio processes may involve people in decisions about "ownership" of their reflections and chosen artefacts. Charlsworth and Home (2004) assert:
> ... when ePortfolio advocates talk of learners 'owning their ePortfolio', they rarely, if ever, mean to base that 'ownership' on the legal practicalities – it is rather a rhetorical tool (mis)used to emphasise the centrality of the learner's own experiences to the PDP/ePortfolio process - the learner more accurately has some control over the use of or access to, or has legally exercisable rights over or in, the data in the system.

e-Portfolio processes may also involve learning to connect disparate items and to classify a heterogeneous collection according to needs. This may involve learning new skills such as concept mapping. e-Portfolios, particularly those for reflective learning, grow over time. People who keep e-portfolios will need to undertake periodic reviews of their collection and perhaps discard or archive older items, leaving their "live" portfolio "fresh".

Learners recently have been exposed to Virtual Learning Environments (VLEs). The addition of e-portfolio systems to these increases the complexity of the learning process. Providers of VLEs are beginning to offer integrated e-portfolio "modules". How e-portfolio systems will

work with VLEs is only now beginning to be explored. There is, however, a fundamental difference between the institution-centred VLE and the learner-centred e-portfolio.

e-Portfolio Implementation

Experiences in the United Kingdom, Ireland and the Netherlands have shown that e-portfolio implementation is difficult. The following issues are critical:

- clear definition of the goals for e-portfolio projects
- maintaining multiple stakeholder perspectives
- developing processes (pedagogical, administrative, technical) in collaboration
- ensuring institutional support both managerial and functional
- integrating technologies (systems are componentised and deployed in frameworks)

E-portfolios are being used for different purposes. Most scenarios focus on counselling, assessment, planning, or a combination of the three. In some cases e-portfolio's are being used as institute wide systems, in other cases just in particular students groups with a limited number of staff members[9].
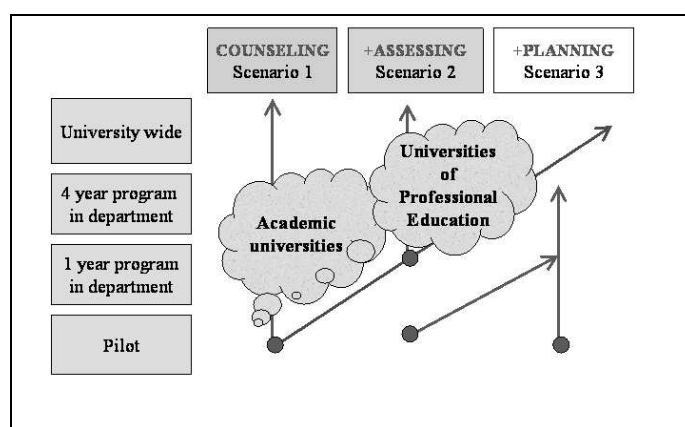

Figure 2:
Scenario model and toolkit developed by the Digital University (Netherlands) for different stakeholders planning implementation for "Folio Thinking" (Veugelers and Kemps 2004)

A multi-disciplinary approach is essential with the involvement of all of stakeholders. Most projects tend to focus too much on teachers and the difficulties coaching and assessing students with e-portfolio's. Students are sometimes considered to be an unproblematic group since they grow up in a digital age. But the students' perspective should not be underestimated. Working with e-portfolio should be embedded in their everyday workflow in an attractive way. It is often the element of reflection that tends to be unappealing for students. Students need to have discretionary control over the time they spend on e-portfolios and must choose to engage voluntarily.

Teachers are key players in the implementation process. Stefani (2005) highlights the benefit of staff members working with e-portfolio's for their own development. There are different discipline cultures that may stimulate or inhibit the uptake of e-portfolios. As staff will have developed institutional and professional survival strategies under pressure of multiple demands on their attention e-portfolios for them must also have tangible rewards.

Managers should be actively engaged from start to finish in e-portfolio projects. The lines of development are best chosen as a result of a bottom up process, but after the decisions are made, management should define a strategic framework in a goal-directed way. Institution-wide support units should also be involved.

There are technical challenges to the development and implementation of any large-scale distributed database. It is necessary to create functional workflows in an integrated technical

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[9] The digital university in the Netherlands has developed a model that can be used together with a website containing a toolkit for different stakeholders in planning implementation for the specific kind of Folio Thinking the institute aims for. http://www.du.nl/portfolioimplementatie (Translation in English available). See also Veugelers and Kemps 2004

infrastructure. In most cases an e-portfolio is not a single tool. It is part of a larger technical configuration in which the required functionality may be met by the interoperation of different systems. IT staff must be included in e-portfolio teams. Localisation of e-portfolio systems is necessary to reflect other major institutional systems' look and feel and to capture relevant institutional data in its local context and "dialect". The design of the user interface and interaction design is critical issue, which is often neglected.

Concluding thoughts

e-Portfolio technologies and practices are very new. National agencies tend to drive innovation in the UK. Whereas in the Netherlands innovative practice is more driven by institutions through a collaborative approach, in Ireland innovation in e-portfolios is being driven principally by pioneering practitioners.

We conclude:
- functionally today will appear limited within two or three years
- future functionality will probably have been unanticipated
- implementations will initially be educator-centred rather than learner centred because of policy and funding regimes
- a very open approach to training of teachers and students is needed
- to retain flexibility it is important not to lock things down in systems
- there should be disaggregation of both components and support for systems; a single, central unit supporting a monolithic system is unlikely to have the flexibility to respond to future institutional needs
- the function of storing e-portfolio items should be separated from the functions of access management and data entry

e-Portfolios involve students and institutions in multiple levels of novelty. We need more experience, case studies and communication. We need to share common conceptual models. Learning from each other and with each other, making new choices together from different perspectives, helps to keep all stakeholders involved and is a key factor for successful implementation of e-portfolios.

Informal Learning with Ubiquitous Computing

Introduction: context

Informal Learning occurs when a learner is motivated to follow some self-directed learning. It is important to note that there appears to be great variation in the literature on 'informal' and 'non-formal' learning regarding definitional and theoretical issues. The context of such learning seems crucial and we would expect to see attributes of informality and formality present in all learning situations. Attributes of formal and informal learning can typically be described in terms of location/setting, process, purpose and content. It may be useful to think of non-formal learning as being something the tutor knows about and informal learning as either being carried out under the radar of a tutor or something carried out individually by a self-motivated learner. According to a large-scale Canadian study people are now averaging about 15 hours a week on informal learning activities related to such things as employment, housework, community work and general interests – yet very little of this informal learning is supported by e-learning or ubiquitous computing.

Ubiquitous Computing envisages environments that have computers embedded in every day objects as well as more traditional computing devices e.g. laptops, desktops, palm held devices, mobile communication devices etc. One of the central themes of ubiquitous computing is the interconnection of the devices to support user goals or activities e.g. smart living room, smart building etc. In such environments, the computing is performed both explicitly by the user and, where appropriate, implicitly in anticipation or as a reaction to activities of the user. The vision of e-learning in ubiquitous computing environments raises the idea that the environment, and the devices in that environment, can be coordinated to help support the learners activities or collaboration. Although we have not achieved such environments, different aspects of such environments are being tested and explored. Simple

examples of such ideas can be seen in the coordinated use of mobile handsets, traditional laptops and collaboration tools to support learning.

Thus informal learning may harness ubiquitous computing environments of the future by provide 'learning services' to people in formal, non-formal and informal learning settings, and by helping people to manage their personal learning goals, projects and informal learning activities.

Challenges and Opportunities

The challenges and opportunities for informal learning in ubiquitous computing environments can be thought of involving three interrelated aspects, namely:
* Educational Environment
* Personal Environment
* Technical/Computing Environment

Formal to informal learning is a continuum: at the formal extreme all control over the learning process lies with the tutor and at the informal extreme the control over the learning process lies with learner.

What causes learning? All applications need to hook into what motivates the learner so tools and devices (ubiquitous computing) can be effective in the learning process.

How can ubiquitous devices be used effectively in a learning situation? The activities within more formal learning require a change in pedagogy. Ubiquitous computing and computing devices challenge the control of the tutor and put more control in the hands of the learner.

Is there a need for a definition of informal learning? What are the cultural challenges of shifting to a personal / informal learning model and a move away from institutional and tutor control? There is a move to learners taking on responsibility for learning and their own cultural expectations. Is it is possible to move to more personalised learning, which is independent learning, and make it transferable between institutions and organisations.

Does successful informal learning tends to be supported by strong underlying formal learning? It needs to be recalled that the measurement of informal learning can change what you are measuring.

Ubiquitous Computing

Ubiquitous computing can be defined as the integration of traditional computing with embedded devices (e.g. smart chair). It was observed that truly ubiquitous computing is long way off; adaptive devices (wireless / mobile) are here now. A granular, component approach to tools to support personalisation and ubiquitous computing needs to be taken.

But, is ubiquitous computing a friend or foe? If it is to be a friend it is necessary to not focus on technology but on learning needs and ask how do we build tools that support informal and personalised learning?

It was observed that there is a requirement to be able to switch off personalisation (but remember HAL?). When and how do you want your personalisation? How will personalisation information be implemented? There are big trust issue in ubiquitous computing. These are affecting its development and to some extent inhibiting and shaping its growth. Security is a concern with personal information: who holds it and who uses it? Personalisation can be the reverse side of surveillance. When the environment knows enough about you to personalise services, will this just be targeted marketing such as the supermarkets practice with their loyalty cards? In this respect convenience can sometimes overcome the trust issue; some people appreciate Tesco's remembering what they buy each week.

The issues and examples

The strand shared knowledge about environments, and examples of informal learning supported by (quasi-)ubiquitous computing. Figure 3 summarises the main conclusions of the

strand. We found that informal learning was typified as being learner-initiated and that the learning was 'owned' by the learner. There is a powerful overlap with ubiquitous computing devices, which are owned by the learner. Ubiquitous informal learning, therefore, has the real potential to lead to learner empowerment. However, this potential will only be met if a delicate balance is found between issues of control, freedom and skills/abilities for learners.
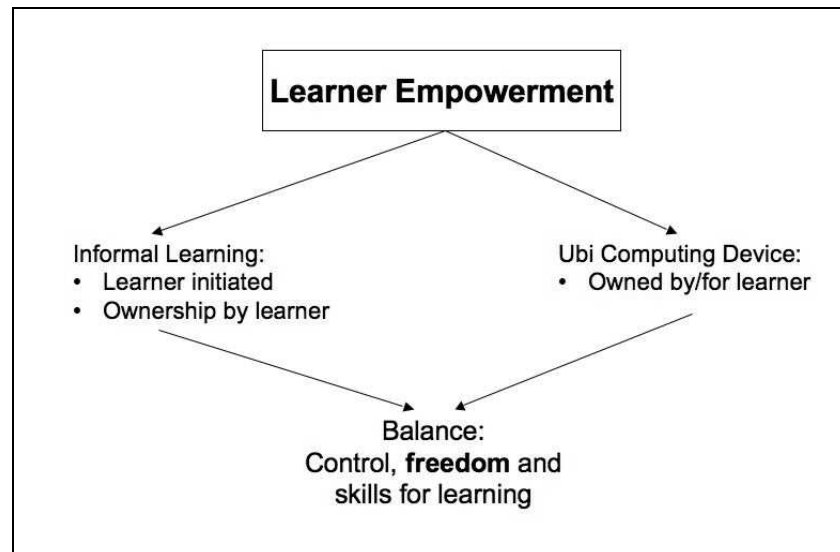

Figure 3

Summary of ubiquitous computing and informal learning issues and examples

- Users in charge of service (Ubi and learning)
- Developing policies at every level
  - e.g. Warwick Blogs: owner of blog entry decides where entry published; Adaptive learning "instrument" at Trinity College Dublin
- IKEA and RLOs - using the motivation for informal learning to help formal learning
- Users as quality judge – big issue
- Accessibility
- Users as part of and connected to a network of people, resources and devices
  - MiniMe (Holland), provides information about user thorough such things as wearables
- Users as providers and consumers
- Peer learners
- Mapping of self relative to community
  - University of Twente: learners provide content and control who views resource
  - Open University of the Netherlands: using previous learner trails for learner recommendations
- Informal learning environments
  - leather sofas at Warwick & Learning Grid (complete control given to students)

Future project (working) titles

The strand explored and proposed a number of themes and titles for collaborative research projects:
- Designing for Informal Learning (IL)
- Role of IL in higher and further education
- Assessment and reward of IL
- Tools for empowerment of users
- Security and access
- Digital games as a mechanism for supporting IL in Ubi Environments
- Trust vs Access

References

Aalderink, Wijnand & Veugelers, Marij (2005). E-Portfolios in the Netherlands: stimulus for educational change and lifelong learning. In: Lifelong E-learning, EDEN 2005 Proceedings (http://www.eden-online.org/, accessed 17 November 2005)

ALT/SURF (2004), ALT-SURF seminar: ePortfolios and Digital Repositories. 22 and 23 April 2004, Edinburgh UK (http://www.surf.nl/download/ALT_SURF_briefingpaper2004.pdf, accessed 17 November 2005)

BECTA/JISC (2004), e-Portfolios and e-Assessment: JISC and Becta announce major collaboration (http://www.becta.org.uk/corporate/press_out.cfm?id=3454, accessed 17 November 2005)

Charlesworth, Andrew & Home, Anna (2004), "Legal Aspects of ePortfolio Systems: A Short FAQ". Centre for IT & Law, University of Bristol, JISC Study to explore the legal and records management issues relating to the concept of the Lifelong Learner Record (http://www.jisc.ac.uk/uploaded_documents/Legal_Aspects_FAQ.pdf, accessed 17 November 2005)

Department for Education and Skills (DfES, 2005), e-Strategy Harnessing Technology: Transforming learning and children's services (http://www.dfes.gov.uk/publications/e-strategy/, accessed 17 November 2005)

European Institute for e-Learning (EIfEL, 2004), Europortfolio (http://www.eife-l.org/portfolio, accessed 17 November 2005)

Higher Education Funding Council for England (HEFCE, 2005), HEFCE strategy for e-learning (http://www.hefce.ac.uk/pubs/hefce/2005/05_12/, accessed 17 November 2005)

Grant, Simon (2005), The electronic portfolio domain: a suggested set of interrelated technical definitions. (http://www.inst.co.uk/clients/jisc/teche-pdef.html, accessed 17 November 2005)

Richardson, Helen & Ward, Rob (2005), "Developing and Implementing a Methodology for Reviewing E-portfolio Products", a report to the JISC. Centre for Recording Achievement, Version 1.0: 30th March 2005 (http://www.jisc.ac.uk/uploaded_documents/05%20epfr%20REPORT%20version%201.0%20final.doc, accessed 17 November 2005)

Stefani, Lorraine (2005), "PDP / CPD and e-portfolios: Rising to the Challenge of Modelling Good Practice". Keynote presentation at ALT Spring Conference and Research Seminar 2005 in association with ILTA and SURF, 31 March 2005, Dublin Institute of Technology (http://www.alt.ac.uk/docs/lorraine_stefani_paper.doc, accessed 17 November 2005).

Tartwijk, Jan van, Driessen, Erik et al. (2003). Werken met een elektronisch portfolio (Working with an electronic portfolio). Hoger Onderwijs Praktijk. Groningen: Wolters-Noordhoff. (http://e-learning.surf.nl/portfolio; English version available at http://icloniis.fsw.leidenuniv.nl/surf-efolio/Efolio_in_NL/index.htm, accessed 17 November 2005)

Veugelers, Marij & Kemps, Alex (2004), "The Manager's Challenge: With One Toolkit, Three Scenarios and Change Management, Start the Portfolio Implementation!" paper presented at Eportfolio 2004, October, La Rochelle. France (http://www.eife-l.org/publications/proceedings/ep2004/programme/, accessed 17 November 2005)

Annex 1

Participants in the 2005 research seminar

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Simon Grant	Elizabeth Symonds
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Paul Hollins	Christine Vincent
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Paul Kelly	Mike Weaver
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Alex Kemps	Joachim Wetterling
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