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Personalised learning environments, portfolios and formative assessment in the workplace

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The Third Cambridge Assessment Conference: A critical look at the impact of e-assessment on education

Robinson College, University of Cambridge, UK

15th October 2007

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Abstract

Alan Brown is an Associate Director of the Teaching and Research Learning Programme (TLRP) and, together with colleagues, was involved in a TLRP Development Project on the Design of Workplace Personalised Learning Environments (PLEs) for the development of adult guidance practitioners' technical communicative skills.[1] This development work has subsequently been extended nationally and via a European Framework 7 project to encompass the role of reflective portfolios and formative assessment in helping establish a 'community of innovation'.[2] Such a community can then play a key role in supporting both continuing professional development and organisational change, whereby guidance practitioners are able to reflect upon their learning and career identity development individually and collectively, and crucially are also able to bring about change in practice and their collective understanding of practice.

Introduction

The aim of the Cambridge Assessment Conference is to raise fundamental issues about assessment and its use in modern education systems. This year the theme of the conference is on the use of e-assessment and the likely impact that it will have on education. The conference briefing highlighted that one of the speakers in the first conference two years ago it is often not a question of being clear about the technological solutions but about what we want. A complementary TLRP paper argued a similar line about how important it is to be clear about educational purposes and from that it follows that the key question is what can e-assessment do to help achieve valued leaning outcomes? So the context for this paper is adult guidance in the UK is currently in the throes of a major transformation and guidance practitioners are having to learn, individually and collectively, to adapt their practice in a number of ways in order to improve the quality of guidance they offer clients. So the question becomes can e-assessment help guidance practitioners critically reflect upon their practice and can they, the organisations they work for and others with an interest in transforming guidance practice be part of a 'community of innovation'? This paper will investigate the extent to which workplace PLEs and reflective e-portfolios could play a key role in this task.

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[1] This project was funded November 2006 – April 2007 by the ESRC/EPSRC Technology-Enhanced Learning programme, Phase 1, Award number RES-139-25-0312. Other members of the project team included from London Knowledge Lab (Institute of Education [IOE] and Birkbeck College): Professor Celia Hoyles; Professor Richard Noss; Professor Alex Poulovassilis; Dr Phillip Kent and Dr George Magoulas; from Institute for Employment Research (IER), University of Warwick: Dr Maria de Hoyos and Lucy Marris; and software development consultant: Graham Attwell, Pontydysgu

[2] The FP7 project is not due to start until April 2008 so the ideas expressed here draw heavily upon the proposal put together by Andreas Schmidt and colleagues: UK guidance practitioners are being involved as one of three use-cases.

Our initial task should be to consider the scale of the learning challenges faced by adult guidance practitioners as the nature of their work changes in significant respects. The salience of the idea of using technology-enhanced learning to support the development of technical-communicative skills (TCS) in adult guidance could be seen in the publication of two major Treasury reports. The first, the Leitch 'Review of Skills, Prosperity for all in the global economy - world class skills' (December 2006), emphasised how the provision and understanding of Labour Market Information (LMI) should be seen as central to both careers guidance and the work of the sector skills councils. The second, 'Financial Capability: the Government's long-term approach' (January 2007), emphasised the importance of people being able to understand financial services and of how people could be supported in developing their financial understanding. The consequences of these two reports was that career guidance should be more strongly underpinned by an understanding of what was happening in the labour market and that career planning should be accompanied with financial planning (for example, in relation to when it would and would not be helpful to take out a career development loan). Now both these areas are fundamentally underpinned by technical-communicative skills (TCS) and the key point here is that it is not enough for practitioners to understand LMI and financial planning, they also need to be able to communicate in such a way that their clients can understand key aspects of these processes too.

Researchers at IER had already been working with the sector skills councils, DfES, careers guidance practitioners, trainers and researchers to develop a web-based resource that provided a single authoritative source of LMI Future Trends and Effective Guidance that could be used to support professional development (Brown *et al.*, 2005).[3] This was welcomed by practitioners but at an extended series of LMI seminars the message was repeated again and again that this helped their individual understanding, but they were less sure of how this could be used with clients. What we were trying to achieve in developing practitioners' TCS could only be successful if their learning could be embedded within their working processes: that is, they had to learn how to utilise LMI more effectively in working with clients **while working with clients**. This meant that practitioners needed to be able to reflect critically upon their own practice and that it would be helpful if they could share their developing understandings in ways that meant that they were collectively engaged in reflection and the creation of new forms of knowledge (about how to use LMI effectively in a range of ways depending upon the needs of their clients). These processes are essentially about learning, assessment and development and in this context e-assessment could clearly be a vital tool in achieving these goals.[4] The tools we are

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[3] The NGRF's LMI Future Trends section organises labour market information on 30 sectors and occupational groups, focusing on future changes in the labour market / skills. See National Guidance Research Forum (NGRF) website: www.guidance-research.org.

[4] This is unlike so many other situations when developers produce an e-tool and because they see opportunities where it could be useful, if it was widely used, they assume it will be useful and used, with no thought about whether learners already have their own processes to achieve their own goals. The result is often that the tools languish largely unused in a 'sea of indifference.' Of course, our own tools may not be widely used, but at least if they are not it will almost certainly be because we have not been able to achieve a sustainable 'community of innovation', not that we had developed tools in advance of a real learning and assessment need.

developing in collaboration with the community are a workplace PLE and a reflective e-portfolio.[5]

Personal Learning Environments in the workplace

Socio-cultural theories of knowledge acquisition stress the meaning of collaborative learning and 'learning communities' (Hung, 2002), while the 'Zone of Proximal Development' emphasizes the importance of collaboration with advanced learners and experts to enhance individual knowledge and skills (Vygotsky, 1978). Agostini *et al.* (2003) complain about the lack of support offered by many virtual learning environments (VLEs) for emerging communities of interest and the need to link them together with the official organizational structure within individuals are working. Ideally VLEs should link together knowledge assets with people, communities and informal knowledge (Agostini *et al.*, 2003) and support the development of social networks for learning (Fischer and Sugimoto, 2006). The idea of a personal learning space is taken further by Razavi and Iverson (2006) who want to integrate weblogs, ePortfolios, and social networking functionality in this environment for enhanced e-learning and knowledge management in order to develop communities of practice.

Based on these ideas of collaborative learning and social networks within communities of practice the notion of PLEs in the workplace been put forward as a new approach to the development of e-learning tools (Attwell, 2007; Wilson 2006) that are no longer focused on integrated learning platforms such as VLEs. In contrast, these PLEs are made up of a collection of loosely coupled tools, including Web 2.0 technologies, used for working, learning, reflection and collaboration with others. A PLE should use social software in the workplace for informal learning which is learner driven, problem-based and motivated by interest and considers learning not as a process triggered by a single learning provider but as a continuing activity. Another development route is constituted by embedded or work-integrated learning support based on the pioneering ideas in the Learning in Process project (Schmidt, 2005) and the APOSDLE project (Lindstaedt & Mayer, 2006) where learning opportunities (learning objects, documents, checklists, but also colleagues) are recommended based on a virtual understanding of the learner's context.

While these development activities acknowledge the importance of collaboration and community engagement and of embedding learning into working processes, they have not so far addressed the linkage of individual learning processes and the further development of both individual and collective understanding as knowledge and learning processes mature. In order to achieve that transition (to what we term a 'community of innovation') then processes of reflection and formative assessment have a critical role to play. The MATURE project will develop the idea of Personal Learning Environment into a Personal Learning and Maturing Environment by:

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[5] The former tool is being developed as part of the European Seventh Framework Programme project 'MATURE', which will provide career guidance practitioners with a collaborative learning environment in which they can develop their skills, knowledge understanding and practice. By embedding this PLE into their work processes, new and more effective forms of learning can take place, leading to an increased exchange of experience between different practitioners. The reflective e-portfolio is being developed in two different adult guidance contexts.

- providing tools supporting the continuity of knowledge maturing from individual to community to organization (e.g., through use of awareness and consolidation tools);
- broadening the scope of artefacts from just content towards content, processes and semantics;
- connecting the tools in a meaningful way based on practitioners' needs and embedded in linked processes of working, learning and reflection.

Traditional conceptions of human resource development (as well as organisational development and innovation management) are supposed to support continuing professional development. Problems associated with training away from the workplace and the challenge of transfer of learning between contexts has led to the development of a number of approaches to the development of e-learning, e-assessment and knowledge management that offer solutions for specific learning needs that can be accessed independent of time and place, including if necessary just-in-time direct from the workplace. However, these approaches have often created a **fragmented learning landscape** that could either be mainly driven by a technological and/or organisational perspective on the one hand, or else a largely individualist learner-oriented perspective on the other hand that does not necessarily link to what is happening in the workplace or the learning of others. The idea that individual, collective and organisational development processes could be linked is therefore attractive: the difficulty, however, is finding contexts where actors at all these levels are motivated to engage in such developments. We believe that for a number of reasons, some of which were outlined above, guidance practitioners do provide a favourable context in which we can test our ideas, precisely because participants at all levels recognise the need to transform practice in a number of respects.

The key requirement, however, is perhaps that the learning activities of practitioners must be conceived (and technically supported) as embedded into, interwoven with, **everyday work processes** (Schmidt, 2006), which are themselves about the creation, transformation, and communication of knowledge about improving practice. How do we foster effective contribution of individual learning activities to organisational goals and ensure sustainable impact of these activities? Individual learning activities are not isolated, but rather have to be seen as interlinked. The development of new forms of reliable knowledge and practice with impact (e.g., in the form of widespread use as new or improved services or processes) is not constructed by a single practitioner, but rather evolves in collaboration with other members of a community. We need to offer a variety of work-relevant knowledge assets and development processes that go beyond just e-learning content and are integrated within a workplace personal learning environment that can help practitioners and the community as a whole to reflect upon individual and collective learning, assessment and development activities in ways that increase the take-up and impact of utilising knowledge and learning within work processes.

Schmidt (2005; Schmidt & Maier 2007) emphasises how we can get an understanding of how these processes might operate within a PLE by looking at 'knowledge flows' across different interlinked individual learning processes. The knowledge becomes less contextualized, more explicitly linked, easier to communicate, in short: it

matures. The **knowledge maturing process** at an individual level is represented in five phases[6]:

- **Expressing ideas**. New ideas are developed by individuals from personal experiences or in highly informal discussions. The knowledge is subjective and deeply embedded in the context of the originator. The vocabulary used for communication or in private notes is vague and often restricted to the person expressing the idea.

- **Distributing in communities**. This phase accomplishes an important maturing step, i.e. the development of common terminology shared among community members, e.g., in discussion forum entries, Blog postings or wikis.

- **Formalizing.** Artefacts created in the preceding two phases are inherently unstructured and still highly subjective and embedded in the context of the community. In this phase, purpose-driven structured documents are created, e.g. reports about practice or process models in which knowledge is desubjectified and the context is made explicit.

- **Ad-hoc learning**. Documents produced in the preceding phase are not well suited as learning materials on their own because no pedagogic considerations were taken into account. Now the topic is refined to improve comprehensibility in order to ease its consumption or re-use. The material is ideally prepared in a pedagogically sound way, enabling broader dissemination, e.g. linking general learning objectives with case examples.

- **Formal training.** The ultimate maturity phase puts together individual learning objects to cover a broader subject area (in this case in relation to improving effectiveness of guidance through giving it a stronger LMI focus in ways that become increasingly linked with practice and particular use-cases). As a consequence, this subject area becomes teachable to novices (in this case it can be used with trainee practitioners), with assessment playing both a formative and possibly summative role.

However, we also need to consider the different **levels of interaction** that accompany this process. Here we find a progression from the level of individuals to communities and organisations, with personal networks and professional communities ensuring that interaction goes beyond the boundaries of particular work organisations. Additionally, the maturing process needs to be framed by the idea of developing different types of **knowledge assets** that are vital for the learning, working and development in any kind of network or organisation. These assets relate to content, processes and semantics. **Content** such as documents, images, videos etc. can clearly play an important role in e-learning. **Process** development can include reflection and formative assessment in ways that enable recording and sharing of individual work practices. Finally, for the linkage of assets it is necessary to take the **semantics** into account as to how the different assets can support individual and collective learning processes by providing the basis for mutual understanding. This is especially important as we will be allowing bottom-up development of ideas about effective practice, with practitioners

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[6] Here we are only concerned with knowledge relating directly to practice: e.g. in this case linked to how LMI **is** being used with clients. So some more general ideas could have been developed through engagement with the project researchers: e.g. how they **might** use LMI in practice.

contributing their individual views, experiences and insights. Without a semantic integration such an approach could in some cases embed misinterpretations.

Overall then, we believe this approach to developing a workplace PLE for guidance practitioners is one which holds out the prospect of deepening and contextualising knowledge and understanding of how to apply a range of TCS in the delivery of guidance with a stronger focus upon LMI. Such an approach has processes of critical reflection and formative assessment embedded within it and now we should turn to one of the first tools being developed that exemplifies these processes and which will sit within the workplace PLE: an e-portfolio.

E-portfolios

The following is an account of our first attempt to support the introduction of a reflective e-portfolio in an adult guidance context: the setting is a UK call centre sub-contracted by a major e-learning provider to deliver telephone career guidance. The aim of the e-portfolio was to support the continuing professional development of career coaches providing a service to a wide diversity of callers with a range of needs. The ultimate aim of the e-portfolio was, therefore, to improve services to customers. Whilst both the employing organisation and contracting organisation were initially able to provide a clear specification to inform its design, different priorities emerged from a process of consultation with a group of managers and end users over a ten month period. Characteristics of the organisational culture of the employer had to be navigated carefully. It became apparent that this particular process of technological implementation was being mediated by different interpretations and understandings of technology and its uses. Both the technology and the resulting technological change were the outcomes of a series of complex social interactions.

The largest telephone helpline service in the world for delivering career guidance is currently known as the 'Learndirect' helpline and was launched in the UK in February, 1998 (Watts & Dent, 2002). Its genesis can be traced to the policy interest in educational guidance for adults in the early 1990s and the introduction of a guidance helpline in Scotland in 1997. A national helpline, called Learning Direct, was set up in 1998 in a single call-centre, operated by Broadcasting Support Services (BSS), based in Manchester, England. At this time, the policy intention was for the helpline to become the information and advice service for the University for Industry (UfI), when established. Accordingly, the sub-contract held by BSS was transferred to Ufi in June, 1999.

Demand for this free service grew quickly, stimulated by the deployment of a substantial marketing budget. The initial target for calls in the first year of operation was 250,000, with plans for the rapid expansion of capacity to handle four million calls annually. To accommodate this level of expansion, the capacity of BSS was expanded with the opening of a second call centre in Leicestershire (Watts and Dent, 2002). Significant productivity gains to the operation of this call centre service have been attributed to a combination of financial incentives built into the BSS contract; strict monitoring of staff performance; and innovative working practices (Watts and Dent, 2006). It is employees at these two call centres, Manchester and Leicester, who were involved in the pilot of the e-portfolio development. Within the two call centres, there are three levels of staffing, each dealing with calls from customers of increasing complexity. This differentiation reflects the different levels of qualification and/or

expertise of employees, as well as job function. It was the highest staffing level (that is, the lifelong learning advisers, subsequently re-named careers coaches), offering 'in-depth' career guidance to customers, who were the target for this e-portfolio development.

Portfolios have been a feature of vocational and professional programmes for a number of years, and have accumulated a range of meanings (Ward & Richardson, 2005). Their use has ranged from simply providing a record of progress; collating evidence for assessment of outcomes; and encouraging reflection on the process of learning and development to more complex tasks (Beetham, 2005). Typically, they have been used within the context of particular learning programmes for the collation and assessment of evidence. Increasingly, however, they are being used to collate evidence from across different learning programmes to provide an overview of learners' progression and achievements to date, together with opportunities for reflection and personal development planning. In the UK, examples of such schemes include DfES Progress Files (14-19), Records of Achievement (HE) and Individual Learning Plans (FE and Adult/Lifelong Learning) (Beetham, 2005). Professional bodies and large employers are also beginning to encourage the use of portfolios (e.g. the NHS, the Teacher Training Agency, the Armed Forces, the Royal Institute of British Architects).

The term 'e-portfolio' (that is, electronic portfolio) simply indicates that some (or all) of the evidence is collected in digital form (Beetham, 2005; Lorenzo & Ittelson, 2005). The various definitions of 'e-portfolio' tend to relate to a collection of digital resources that: provide evidence of an individual's progress and achievements; are drawn from both formal and informal learning activities; are personally managed and owned by the learner; can be used for review, reflection and personal development planning; and can be selectively accessed by other interested parties (e.g. peers, assessors, awarding bodies, prospective employers).

They can also be used for different purposes. So for example, e-portfolios can be used to support: individuals in taking responsibility for their own personal and professional development; summative assessment; formative assessment; learning and learning to learn; presentation of best or most relevant achievements; and personal and professional development planning. Because e-portfolios commonly need to support transition between different learning providers, and between learning and work, information needs to be presented according to common standards and terminology.

E-portfolios for learndirect *Advice (*ldA*)* and Broadcasting Support Services (BSS)
E-portfolios represented a potentially powerful tool for developing reflective practice amongst IdA/BSS practitioners, thereby improving their job performance. It has been estimated that people are now averaging fifteen hours a week on informal learning activities, yet very little of this informal learning is supported by e-learning (Roberts *et al.,* 2005). So in this particular organisational context, e-portfolios also offered a method of recording both formal and informal workplace learning. Additionally, they offered a potential framework for gaining formal accreditation of workplace learning. At the level of the individual user, minimum requirements can be identified for e-portfolio systems. These include the ability to uploading files; entering reflective

statements; and displaying materials (Roberts *et al.,* 2005). Ideally, these systems should offer users flexibility to input materials; the facilities for on-going editing, updating and review; and the ability to organise and retrieve objects/artefacts. There are, however, more complex requirements if the e-portfolio system is to inter-operate with other systems (such as learner records, virtual learning environments or assessment systems) and if it is to allow learner data to be shared with other organisations (e.g. for accreditation).

In considering the development and implementation of an e-portfolio system in any organisation, there are a number of important considerations. Those particularly pertinent to IdA/BSS included: general issues of data ownership and confidentiality; maintenance; relationship with management structures; regulatory and policy issues; and support for individuals engaged in portfolio development in terms of training, dedicated time and recognition/accreditation of informal learning. One low cost option for ldA/BSS to consider would be to introduce a standard product. However, the process of examining the organisation's needs and designing a bespoke e-portfolio had the potential to add considerable value to its implementation, since the emphasis would be on the *process* of ensuring that the e-portfolio accommodated the particular needs of the organisation and its employees, rather than the needs of the organisation having to be fitted into an existing e-portfolio *product*. The process of working with the organisations (IdA/BSS) included a number of stages, as follows:

Research phase:
This involved a study of possible options in the context of IdA requirements.

Awareness-raising phase:
Involving four separate presentations to possible target groups and stakeholders, to outline the possible benefits of portfolios and introducing the concept of reflective learning. This was an essential stage of the process to secure 'buy in' and ownership of the e-portfolio by potential users. Since the benefits of reflections lay at the centre of e-portfolios, it was crucial to allow time for the potential audience/users to reflect on what was being offered and become familiar with the concept of 'reflective practice'.

Consultation phase:
Although the development team had a vivid sense of what an e-portfolio system might comprise for ldA/BSS and how to design and implement it, experience suggested that it is best to involve the users early and intimately, finding out what features they really wanted. Consequently, the team proceeded in frequent small steps, co-designing closely with the user community, delivering real functionality at each step, constantly testing 'real-world' situations and rapidly adapting to the problems and opportunities identified by users.

Design phase:
An appropriate technical framework for the construction of an e-portfolio involved one which gave the user a strong sense of ownership of their skills; of the process of planning and development; a sense of connection with peers; and a sense of being valued by the institution. Four core functionalities were identified: a reflective diary space; a personal 'dashboard' (for organising and presenting information sources); features for user-to-user community building; and spaces for collecting, organising

and sharing resources. Three overarching functionalities, weaving throughout the above, would be: 1) very strong discussion features for ad-hoc and more goal-directed discussions, 2) the ability to plug-in special planning tools such as questionnaires and simulations, and 3) close integration with the day-to-day working practices of the users and with institutional credit-acknowledgement.

Piloting and refinement phase:
Although the entire development of the e-portfolio was in close co-operation with users, piloting the emergent e-portfolio system with a small user group was an important part of its overall development.

Implementation phase:
Details of the implementation phase were negotiated with IdA/BSS and involved: discussion with personnel responsible for staff training to establish what was feasible and possible; preparation and briefing of user group(s); and user support (e.g. on-line support for users, at a distance).

Discussion

The implementation of technology operates not only as a catalyst for change but may also be used to encourage change. It is too early to assess the extent, or the manner in which the introduction of an e-portfolio into the call centre has affected employees at different levels of the organisation, or to discuss their influences on the organisational culture, organisational structures and social relations. Certainly, the introduction of e-portfolios has the potential to impact on all of these variables. One other issue currently being worked through are the patterns and forms of access to, and participation in, the new e-portfolio technology. Additionally, the benefits and problems arising from the introduction of this technology into the work setting for training purposes are not yet apparent. It is unlikely that technology will prove to be an independent force in organisational transformation, but is likely to play a significant role in any changes that occur.

The extent to which the company chooses to harness the technology to encourage change is currently another unknown. It is likely that the introduction of the e-portfolios will alter and, in some way, interrupt the flow of information and communication through and within the organisation. An organisational culture may become 'technologised', whereby cultural elements are mediated by the integration of the e-portfolio. The organisational culture was characterised by two different ethoses that represent both positive and negative (or sceptical) attitudes towards technologies within the organisation.

It is too early to make judgements about the use of e-portfolios in the particular case, but it is clear that a refined e-portfolio can play a useful role as one element of a suite of tools within a workplace PLE designed to help in the development of adult guidance practitioners' technical communicative skills. The PLE itself will be designed to facilitate a range of learning, assessment and development activities embedded within working processes so as to contribute to the establishment of a 'community of innovation'. For the purposes of this conference the key lesson, however, is that if the learning goal is sound and the approach to e-assessment

supports that goal, then formative e-assessment can indeed play a valuable role in improving the quality of valued learning outcomes.

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