Using web-based tools for employee skills self-assessment and practitioner professsional development

Alan Brown [1]
Jenny Bimrose [1]
Graham Attwell [2]

[1] Institute for Employment Research, University of Warwick
[2] KnowNet and Pontydysgu

Contact details:
Dr Alan Brown
Institute for Employment Research
University of Warwick
Coventry CV4 7AL

Tel: 02476-523512
Fax: 02476-524241

e-mail: alan.brown@warwick.ac.uk

Graham Attwell, KnowNet and Pontydysgu,

e-mail: graham@theknownet.com

Using web-based tools for employee skills self-assessment and practitioner professsional development

Alan Brown [1] Jenny Bimrose [1] Graham Attwell [2]
[1] Institute for Employment Research, University of Warwick
[2] KnowNet and Pontydysgu

1.   Introduction

The starting point of this paper is that the authors have been involved in research and development of networked collaborative learning for seven years. During this time, it has been very much easier to get funding for program development that approaches this issue from a technicist paradigm rather than one that tries to emphasise the social dimension to collaborative learning. We will illustrate this by considering two contrasting examples of the development of web-based tools for a one-off program and for a continuing service. The program involves users reviewing the different sets of skills they currently possess and how they can represent their achievements and aspirations for the future in skill terms (and how they use e-learning to help them achieve their goals). The service involves the provision of a web-based platform to support practitioners as collaborative participants in a dynamic community of practice.

2.   Program development

The Skills Review program has been developed in the UK as part of a European Union funded project. The group that commissioned our work near the end of the lifetime of their project was concerned that they had built a suite of programs that employees in small companies were supposed to use to support their learning and development, but in fact remained largely unused. They had noticed that on another project we had built web-based tools that were being widely used by our target group (careers guidance practitioners and unemployed adults). They overlooked the obvious difference that we had worked intensively with practitioners to build a community that was likely to use the tools we had developed in partnership with them. Instead they wanted us to develop a 'quick technological fix' that could 'lead' employees towards their products.

So building on our earlier work on skills profiling we developed a skills self-assessment tool for employees in small businesses. [Since then, in fact, the program has been used in a variety of other processes including appraisal and staff development; formative assessment prior to entry on learning programmes and in recruitment.] The review provides the user with a detailed self-assessment of their skills and abilities and those skills they wish to acquire. Its greatest benefit is in guiding the user through a process of self-enquiry and reflection on their learning, skills and knowledge. The program is intended to supplement the role of careers guidance practitioners and others involved in employment, staff development and assessment processes. The intention of this program is to get users to review the different sets of skills they possess and how they can represent their achievements and aspirations for the future in skill terms. In particular it helps them review their current skills and to think about what skills they may require in two years time. The program also reviews the extent to which the skills and abilities that they already possess can be used as a basis to develop their skills further through on-line learning. The program supports different pathways through the skills review depending upon the complexity of their job and the range of skills typically required. The outcome of the program is a detailed review of the skills they currently possess and those that they would like to develop further expressed in terms of technical skills; information skills; people skills and learning skills.

One of the aims of the program was to encourage a set of individuals who have traditionally been reluctant to use e-learning (employees in small businesses) that this should be considered as a potentially useful learning tool. The program was therefore viewed as a means of encouraging individuals to at least consider that they did have some skills that would be useful for the purposes of e-learning. The program had a measure of success in other directions, but the problem remained, however, that although this did provide a potential 'way in' to the suite of e-learning programs available from business support organisations, the programs themselves remained relatively under-used. [Interestingly, the group that had commissioned us was just happy that they had at least one product that was being used, and it did also offer a way of representing coherence in their overall approach. Our tool encouraged employee development and employees then chose the most appropriate method for them, and if they chose e-learning then the project had developed a suite of programs they could use. They still had not had many people use those services, but, in a triumph of hope over experience, this they could attribute to the fact that the skills review program was only developed at the very end of the project.]

So, once again, (see http://www.theknownet.com/skills_review/about_skills_review.html), we have a neat technological solution, but even with a cunning plan to show people that they did have skills that (they did not necessarily know) could be useful for e-learning, take-up of the e-learning programs was likely to remain very low. This was particularly likely as there was no longer any project promoting their use. The failure to have any lasting impact was entirely predictable, and the fate of legions of other similar development projects, as it was trying to engage a 'community' that had no real existence. 'Employees in small businesses in a particular area' represents more of a label than anything that could be recognisably called a community. Whereas a precondition for networked collaborative learning is that a 'community' should either already exist or else steps need to be taken to build one. Our attempts at developing a service to support the professional development of guidance practitioners contrasts sharply with the approach outlined above, because it takes very seriously the importance of developing a 'learning community', within which web-based support plays a facilitating role. This is our second exemplar and it is that to which we now turn.

3.   Use of web-based tools in the delivery of a continuing service

3.1   Context

Our second example involves the use of information and communication technologies to support the knowledge development of a dispersed community of practice of careers guidance practitioners. The project had developed prototype web-based collaboration and knowledge sharing tools in order to provide a comprehensive telematic platform for interactive and focused knowledge sharing and transformation for Careers Guidance students, tutors, practitioners, policy makers, and training organisations as collaborative participants in a dynamic community of practice. This was one of a series of projects developing web-delivered tools and environments to support the development and sharing of knowledge by professional communities of practice. These projects are innovative and Malloch and Attwell (2001) believe they are interesting in three areas: software innovations, theoretical intent, and tight, responsive coupling of social research with software design and real-world usability.

The telematic activity in this particular context, however, was only an 'add-on' to a project that was principally concerned with the use of labour market information to enhance careers guidance practice. The limited intention of this part of the project was therefore to demonstrate that it was technically possible to develop a telematic infrastructure of support for careers guidance practitioners. This we duly did and we discussed our findings at a previous ECER conference (2000), the results of which have subsequently been published (Brown, Attwell and Bimrose (2002) in 'Networked collaborative learning' edited by Lally

and McConnell). The next phase of development required funding but we ran into difficulties, principally we think because of our belief that a series of face-to-face workshops was necessary in order to develop both the initial material and commitment to the development of a 'learning community' to support the professional development of guidance practitioners. There was a marked reluctance of funders to 'buy into' the idea of parallel social and technological development. We could probably have secured funding for a technology-only-based solution, but we feel that we had already gone as far as we could down that road.

We had what we believed to be a mature development process, but the upheavals associated with the reorganisation of guidance meant that simultaneously there was a need for that process but that the key players were too concerned with their own activities to address some of the broader concerns. This has started to change as the new structures have bedded down and significantly those involved with careers guidance policy and practice have been increasingly confronted with the problem of managing knowledge so that they can:

- justify levels of public expenditure and defend current practice;
- respond flexibly to change; and
- develop future policy and practice.

A large government department, like the Department for Education and Skills (DfES), commissions research on careers guidance and has to be able to draw upon a wide range of specialised knowledge. They felt that one problem is gaining access to that knowledge and it would be enormously helpful if all the relevant information was in a single easily accessible place. Hence the calls to set up a comprehensive knowledge database. A recent conference organised by the UK Guidance Council in (May, 2002) highlighted a need for the guidance community to have access to a specialist and comprehensive knowledge database, a 'depository' of careers research and information. We attended that meeting and were the only dissenting voices to a technological solution. We argued two major problems would remain with such a model:

- much of the material suitable for such a database will have been primarily written for academic audiences, so may not be generally accessible;
- the stored knowledge would need to be constantly updated and adapted for new situations.

We believe that groupware applications offer the possibility to address these problems by providing a shared workspace. However, they often do not seem to provide enough support for a community to regulate their own learning activities and become self-supporting. We proposed a more interactive and collaborative approach to knowledge creation based on our prototype development work (which had been developed during the previous (ESF funded ADAPT) project mentioned above). This would involve the formation of expert groups to discuss issues of policy and practice. These groups were to form a centre of expertise for particular topics and have several tasks, especially, to:

- Specify key issues and identify any gaps and problems related to their expertise;
- Create a structure for a knowledge repository and outline ways to navigate that structure;
- Develop support services for others with particular interests in this area. For example, these groups can provide a focus where people can pose particular questions.

In this way, a shared knowledge base will be constructed, not from an a priori comprehensive blueprint but by being grown more organically from contextualised problems that policy makers and practitioners face. In this way, it will be possible to advance through processes of

knowledge combination, where existing available knowledge is combined with new insights to create new forms of contextualised knowledge. Creating online communities of practice in this way offers advantages:

- It offers the chance to collaborate independent of time and space;
- It makes it possible for people to participate in their own time and at their own pace;
- Contributions can contain text, pictures and links to documents, html pages or other notes;
- Participants are able to explore something thoroughly by writing 'build-on' notes and by so doing elaborate on the knowledge that is already in the database.

The created knowledge can thus be regarded as a social product. It represents not only learning, but also creating knowledge collaboratively: it is a form of knowledge building where individuals (learn to) share their knowledge and create new knowledge together. At the end of August 2002 we finally heard that we had secured, in principle, substantive development funding. As a consequence we will have a three year test-bed for our ideas, after which time, pending a successful implementation, the Guidance Council will take over full responsibility for the process. We have, at last, won the argument, but what type of knowledge building process will we use? (For those interested in following our progress, you will be welcome to visit our web-site http://www.theknownet.com/careers-guidance).

3.2   Longer term aims

We have previously argued (Brown, Attwell and Bimrose, 2002) that one way to build a more interactive and collaborative approach to knowledge creation was to utilise the ideas of Nonaka and Takeuchi (1995) and Nonaka and Konno (1998). They stressed it was important to ensure that there was sufficient time and space for face to face interactions to facilitate socialisation, externalisation (or active reflection), combination of new and existing knowledge, and the internalisation of different types of knowledge. We also consider that this is important if we are to build up the continuing relationships with members of the learning community that will enable us to meet our longer term aims for this research that include:

- continuing enhancement of the achievement of learners, especially of those training to become careers guidance practitioners, and those engaged in continuous professional development;
- the development of the capability of transforming both substantive and developing knowledge bases relevant to learning into effective and efficient teaching and training practices (our argument is that it is possible to transform the knowledge base underpinning careers guidance into a form that is much more amenable to the active engagement of teaching and guidance professionals in processes of knowledge utilisation, transformation and creation);
- although this paper focuses upon a single exemplar (careers guidance), the approach is also being applied in a range of other settings (see, for example, Malloch and Attwell, 2001);
- the research could also act as an exemplar of multi-disciplinary and multi-sector research in teaching and learning (the proposed research is multi-disciplinary drawing upon education, sociology, psychology and economics, but also coupled with technical expertise in telematics. The research into support for careers guidance practice also involves engagement with secondary education, further education, higher education, continuous professional development and lifelong learning).

The research is also intended to support the renewal of Careers Guidance as a key service to education and training. It will involve an imaginative way of linking processes of knowledge development with approaches to tackling the core problems of Careers Guidance practice. It will provide opportunities for network and task group meetings as well as a web-based platform for interactive and focused knowledge sharing for Careers Guidance students, tutors, practitioners, policy makers, and training organisations as collaborative participants in a dynamic community of practice. It will produce models and strategies for effective continuous professional development in careers guidance. Finally, it will allow further investigations into the educational aspects of the innovative use of web-based tools to support a professional community of practice.

The web-based platform for interactive and focused knowledge sharing and transformation shall draw upon material from direct practitioner experience; the use of 'tailored' tools in careers guidance; and material relating to policy development and implementation; as well as reference and research material on guidance practice. Practitioner research will also be encouraged. The key to developing a learning community to enhance careers guidance practice is to set up a genuinely collaborative environment for a wide range of participants. The environment is intended to enable participants to:

- (jointly) develop, edit and modify materials;
- share annotation on material;
- facilitate the sharing of experience;
- promote discussion, sharing and active collaboration;
- offer virtual (and real) spaces for debate and collaboration;
- support action research;
- offer active support and moderation;
- offer support to particular interest groups;
- provide a forum for discussion of attempts to tackle complex problems in careers guidance practice.

3.3   Collaboration

It is expected that staff from many institutions involved in the National Careers Forum Network we set up in the previous project will continue to be involved in this attempt to establish a learning community to enhance careers guidance practice. The institutions include careers service companies; universities with responsibilities for training and continuing professional development of careers guidance practitioners; and those with an interest in research in careers guidance practice. Additionally we will engage in continuing dialogue with representatives of all those with a strategic interest in the development of careers guidance policy and practice, including the DfES; Institute for Career Guidance; and the Learning and Skills Council. The contribution to policy and practice in careers guidance could be further enhanced through identification of the processes that play an important role in ensuring that continuing professional development (CPD) is reflective, forward-looking, dynamic and dialogical. The participation of partners in England, Scotland, Wales and Northern Ireland is important in this respect as the contexts, policies and practices of careers guidance show significant differences in the four countries. This will therefore provide opportunities for mutual learning.

3.4   Link processes of knowledge creation with approaches to tackling the core problems of careers guidance practice

A major concern with the development of learning networks to support practice is that the knowledge generated will be largely decontextualised. This may then mean it is of relatively little use to practitioners in coping with many of the problems they face in practice. One way

of meeting this concern would be for certain parts of training and CPD programmes to focus much more closely upon what practitioners see as the core problems of a profession. Onstenk (1997) defines core problems as the problems and dilemmas that are central to the practice of an occupation. These problems and dilemmas will have significance both for individual and organisational performance. The problems are likely to contain characteristic combinations of organisational issues and socio-cultural problems as well as requiring fine professional judgement. For example, reporting requirements or the need to produce particular types of action plans following an interview may conflict with practitioner views about appropriate practice. How this conflict is resolved could also have implications for the careers company and the educational institution as well as for the client. We do not need to pre-specify the core problems. Rather it is important that we identify these through a facilitation of a dialogue between practitioners and other participants of the learning community. It will then be our task to ensure that there is discussion of the situationally specific choices made in a way that contributes to the development of the profession by, in the terms of Engeström (1995), developing a new activity system.

We are attempting to align pedagogic processes and a web-based knowledge environment to support the processes that lead to the development and use of new knowledge in an innovative way. But for this to happen we need a deeper understanding of the ways in which individuals and communities of practice communicate and the ways in which communication leads to knowledge development. Hence it will be important that we seek to produce strategies for effective CPD for communities of practice in careers guidance that take account of the possibilities of combining the use of the telematic platform with other types of support. Attwell (1997) identifies that the CPD of professionals needs to be reflective, forward-looking and dynamic within a culture that acknowledges the importance of developing practice, expertise and a research capability in an inter-related way so as to be able to support the generation of new forms of knowledge. The CPD of professional communities of practice needs to incorporate current concerns, but also have the ability to look beyond these.

Professional knowledge can itself regarded as a personal synthesis of received occupational knowledge and situational understandings, derived from experimental learning, which are capable of being further transformed through a process of critical reflection. As expertise develops, and new contexts are utilised in the performance of practice, so the processes of research, review and reflection can lead to the creation of new forms of knowledge (Engeström, 1995). Continuing professional development can play a role in making these processes explicit such that others too can share in the developmental process.

4.   Drawing on the experience of others

Because this is challenging territory we looked to see how far we could draw on the experience of others. One influence upon our thinking has been the work of de Laat et al (2001) in seeking to build an on-line community of practice with the Dutch police. They were experimenting with two types of support, and it is the one deriving from a content driven perspective and utilising a discourse model that was of particular interest to us. To facilitate sharing and development of knowledge, creating online communities of practice can be an advantage in bringing people together. It offers the possibility to collaborate independent of time and space. Their computer supported collaborative learning tools made it possible for experts to join communities of practice and participate in their own time and at their own pace. de Laat et al (2001) used a facility for adding notes to contributions as a means to encourage participation, with a note being a contribution that can contain text, pictures and links to documents, html pages or other notes in the shared knowledge workspace. Participants therefore had the possibility of going into something thoroughly by writing build-on notes and elaborating on the knowledge that was already in the database.

By working together participants develop greater competence using what group members already know as an important component and co-constructing plans of action to extend that knowledge (Scardamalia and Bereiter, 1994). For online communities of practice to become used to sharing knowledge, deepening their own and common understanding and creating further insights, de Laat et al (2001) thought it crucial for participants to be able to coordinate, clarify and regulate the discourse themselves. They recommend that in order to support the clarification and direction of the discourse, a model of progressive inquiry could be used. Hakkarainen and Muukonen (1999) believe that progressive inquiry can engage members of a community in a step-by-step process of question- and explanation driven inquiry. We have adapted this approach to our context as follows:

Creating the context: a context needs to be created in order to clarify why the issues in question are relevant and worthwhile for members of the group to investigate - this is what we intend to do through our face to face meetings.

Setting up initial lines of investigation: this can help guide the process of inquiry. Again our face to face meetings will set the parameters for the initial lines of investigation that will be subsequently followed up using the telematic platform.

Feedback and interpretation: once the initial group has received feedback from other participants on the initial lines of investigation, then members of the group (and in our case members of the wider community) are invited to construct their own interpretations. de Laat et al (2001) see the construction of personal working interpretations as guiding the participants to use their background knowledge to offer an explanation for the problem. An attempt is then made to reconcile these interpretations and/or set up new lines of inquiry. A first knowledge base of the group's understanding of how the problem might be tackled is created.

Critical challenge: this developing knowledge base needs to be subject to a wider scrutiny and be open to challenge (and alternative interpretation) - this can occur as more members of the wider community become active participants and start to use the telematic platform. Alternatively, if initially as so often happens, there are relatively few active virtual contributors, we hold further face to face meetings in order to generate and respond to critical challenges and changing interpretations. de Laat et al (2001) argue that the wider community can then be asked to assess the strengths and weaknesses of different interpretations and identify any contradictions, gaps in knowledge and so on.

Searching deepening knowledge: further advance in the different lines of inquiry can then be made by obtaining new information and combining this with existing knowledge. New information may help participants reconstruct their understanding of issues, problems and solutions.

Engagement in deepening inquiry: progressive inquiry involves a process of continuing refinement as ideas are revisited, and more searching questions are asked, thereby deepening the enqury.

Constructing new working theories: by finding answers to subordinate questions, de Laat et al (2001) argues that the community approaches step-by-step toward answering the initial question or problem statement.

de Laat et al (2001) consider that by introducing this model of progressive inquiry you develop scaffolds to structure and regulate the learning activities of the participants. Our approach by making continuing use of face to face sessions adds still greater support to the process of community knowledge building.

5. Future directions for collaborative enquiry and software development

The approach to collaborative experiments and software development of the KnowNet team involves a total commitment to a long-term aim of creating fundamental architectures for online collaboration in the process of discovering what shape those architectures and implementations should take (Malloch and Attwell, 2001). This builds upon our earlier experience of ambitious and radical software development in attempts to leverage or systems-engineer useful solutions from existing tools, and sustained efforts to understand user communities, and to animate and engage them in both types of solution. We have learned that thoroughness of integration is a key issue, as users become frustrated at having to re-express ideas and textually establish relationships when it feels as if 'pointing at' and gesturing would be more appropriate. Another crucial factor is the quality of the interface. Almost all experimental software projects fail to develop thorough interfaces with the 'fit and finish' required to sustain the illusion of ubiquitous action-affordance; real users almost always give up before inducing the opaque user actions which seemed natural to those who implemented them (Malloch and Attwell, 2001).

Our goal is to understand what communities of practice can do with electronic technologies, and to help fundamentally re-invent those technologies so that communities can collaborate effectively in terms of the meanings, actions, objects and discourses natural to them. Learners will then be able to learn by active engagement and creation in a web of ubiquitous meaning and conversation. It is absolutely essential that the experiments in functionality that we undertake do not forsake quality of implementation in the quest for innovation. Users simply will not feel comfortable enough to engage fully in virtual communities and knowledge networks fronted by half-implemented interfaces or backed by half-realised architectures (Malloch and Attwell, 2001).

The KnowNet team strives to create highly usable, robust and beautiful interfaces, and constantly refine our designs in searching for seamlessly intuitive combinations of natural action-affordances and rich content. We think we have already constructed some best-in-class interfaces, for instance our very thoroughly realised virtual resource folders and interactive xml-document viewer. For some of our other interfaces, for instance our powerful tools for sharing arbitrarily structured metadata, or for authoring semantically structured XML documents, we have yet to find the natural way to engage users, but are working hard to do so. In the web of ubiquitous knowledge and discourse we dream of, the interfaces must be intuitive, immediate and powerful, sustaining an illusion that a universe of knowledge and actions on it is present-to-hand as users work. We are committed to constantly improving our interfaces and deploying highly professional experiences for our users (Malloch and Attwell, 2001).

We are hopeful that this and related projects can lead to significant learning, and because of the continuing face to face meetings with small groups of participants, allied to the virtual collaboration, we will be able to maintain a high degree of interaction with the communities. From this we hope to learn:

- what functionalities our communities make use of, and what extra functionalities they could use
- how people in a shared community of practice can create knowledge in concert
- how to make our interfaces more useful and our implementation more responsive
- how to create cleanly extensible architectures, and foresee interoperability issues in future functionality.

Malloch and Attwell (2001) make clear that this is a continuing process: in the near future, we will be pushing forward several lines of design and development which will feed back into the projects, adding functionality and informing our long-term planning:

- re-designing and re-deploying our structured metadata interfaces for describing and searching using arbitrary metadatas
- adding a new interface for managing and discussing the structural schemas underlying metadata and XML documents
- improving the facility for semantic structuring and assertion-making in our XML editors
- implementing a first-phase structured messaging environment, utilising reply gestures and structured message-types, initially for project management semantics
- designing a new, web-based XML editor, embedded in a search and link environment for assembling meanings that include or relate to existing content
- experimenting with other motifs for XML content creation, using qualitative data-gathering techniques
- experimenting with report-generation and querying of qualitative data harvested from structured content and structured discussions
- trying to organise collaborations with like-minded developers and thinkers.

If you find some of the ideas or developments we have discussed above interesting, please contact us (via graham@theknownet.com).

References

Attwell, G. (1997) Towards a community of practice for vocational education and training professionals, in A. Brown (Ed.) **Promoting vocational education and training: European perspectives**, Tampere: University of Tampere Press.

Brown, A. Attwell, G. and Bimrose, J. (2002) Utilising Information and Communication Technologies for dispersed communities of practice, in Lally, V. and McConnell D. (eds) **Networked collaborative learning**, Sheffield: School of Education, University of Sheffield.

de Laat M., de Jong F. and Simons R-J. (2001) **Supporting self-regulation of learning activities in online communities of practice,** Nijmegen: Department of Educational Sciences, University of Nijmegen.

Engeström, Y. (1995) **Training for Change**, London: ILO.

Hakkarainen, K. and Muukonen, H. (1999) **Collaborative technology for facilitating progressive enquiry: future learning environment tools,** Paper presented at the Computer-supported collaborative learning (CSCL '99) conference, Paolo Alto, California.

Malloch, M. and Attwell, G. (2001) **Innovative use of telematic tools to support a professional community of practice**, Paper presented at Online EDUCA conference, Berlin, November, 2001.

Nonaka, I. and Konno, N. (1998) The Concept of "Ba": Building a Foundation for Knowledge Creation, **California Management Review**, 40, 3, 40-54.

Nonaka, I. and Takeuchi, H. (1995) **The knowledge creating company. How Japanese companies create the dynamics of innovation**, Oxford: Oxford University Press.

Onstenk, J. (1997) **Core problems, information and communication technologies and innovation in vocational education**, Amsterdam: Kohnstamn Institute, University of Amsterdam.

Scardamalia, M. and Bereiter, C. (1994) Computer support for knowledge-building communities, **Journal of the learning sciences**, 3, 3, 265–283.