

# Networked learning in further education: a case study

Judith Ramsay<sup>1</sup>, Erica McAteer<sup>1</sup>, Rachel Harris<sup>1</sup>, Murray Allan<sup>2</sup> and Jean Henderson<sup>2</sup>

<sup>1</sup>Scottish Centre for Research into Online Learning and Assessment (SCROLLA), Faculty of Education, Florentine House, 53 Hillhead Street, University of Glasgow, Glasgow G12 8QQ, UK

<sup>2</sup>Scottish Further Education Unit (SFEU), Argyll Court, Castle Business Park, Stirling, FK9 4TY

## Abstract

This paper outlines preliminary research into the development of a formalised mechanism for applying web-based learning materials within further education (FE) and introduces a specific software-based tool - the 'information gateway' (IG) which is designed to support the kind of outcome-based teaching activity which characterises FE.

The IG contains resources which have been mapped to the Scottish Further Education Curriculum. Any virtual learning object can be mapped by subject specialists to the SCQF (The Scottish Credit and Qualifications Framework) at Subject, Course, Unit, Outcome and Performance Criteria levels. This mapping allows teachers in Scottish FE to identify effective learning resources, or share good resources that they have found to other teachers across the sector. The mapping function can extend to other frameworks.

Studies undertaken within three different user populations assessed the use and requirements of the FE community for such a resource. Interview and questionnaire data were gathered from FE lecturers who had been involved with the initial conceptualisation of the resource, with those who had attended IG awareness-raising events and with those who were using it for the first time.

Our findings support earlier research in their emphasis of the critical role of 'real user' needs analysis for the development of good web tools, and support for the development of comfort and familiarity in their use (McAteer et al 2002), for uptake and good practice using ICTs for teaching and learning across the sector.

## Introduction

'Networked learning' can be defined as learning in which information and communication technologies (ICTs) are used to promote interactions: between one learner and other learners, between learners and tutors, between a learning community and its learning resources (Steeple and Jones, 2001). Work presented here relates to the last two elements. Until recently, most research into networked learning has occurred at the school level (Irvine and Williams, 2002) or within higher education (HE) (Harris, 1998; Merisotis, 2001). There is now a developing momentum in the FE sector, as the community adopts networked teaching and learning (Powell and Davies, 2002).

One of the lessons that can be drawn from the roll-out of networked learning within HE is that staff development is essential if the move to networked teaching and learning is to be successful (Dearing, 1997, Alexander, 1999, Harris and Higginson, 2002). Recognising this, the Scottish Funding Council's Scottish Communication and Information Technology (ScotCIT) programme, running from 1998 to 2002 with the aim of extending educational use of ICT's 'from innovation to standard practice' (McAteer et al 2003) had a strong focus on staff development, and the provision of web-based tools for teaching support. Staff development for networked learning brings its own challenges, for example time commitment from academic and support staff, the rate of technological change and the speed with which it can be implemented in educational practice, and the limited access to ICTs for certain learning communities (Harris and Higginson 2002; Ritchie 2000).

It is clear that networked technologies for flexible provision of educational resources supports engagement in learning and teaching within classroom based, distance and mixed mode education and the implementation of a range of pedagogical models. As the FE community increasingly draws on web-based learning resources, its requirement for good tools to support good practice become better understood. Three primary requirements are that they support *task-focused activities*, that they assist in the *delivery of specific learning outcomes* and that they support *reusable content*. The information gateway (IG) reported here represents an attempt to embody these three key imperatives.

#### **Mapping virtual learning content to specific learning outcomes**

Focussing on learning outcomes rather than on merely the learning content leads to a more active and engaging experience for the student with a greater chance of 'deeper' learning occurring (Mayes, 1995; Brown and Duguid, 1996; Mason (1998).

In Scotland, the FE sector works to the Scottish Qualification Authority's (SQA) curriculum, with a set of learning outcomes for each course, which all students should be capable of attaining, specified and standardised across all FE college departments in Scotland (Watson, 2002). A challenge for FE teachers, therefore, is to identify learning materials and resources that assist in the delivery of SQA-specific learning outcomes. Examples of on-line resources include multimedia courseware, web-accessible content, links to information portals providing activities for use as 'learning objects' for use alone or as part of a wider educational activity. As Ritchie (2000) indicated, one way to increase the effectiveness of online materials is to develop them as small modules so that teachers might compile a course of their own; the secret is to provide materials that are suitable for *re-use* as part of a range of courses. Although many high quality subject gateways that aggregate information from disparate sources are available to the education sector, for example, SOSIG (the Social Science Information Gateway), they are not specific to the needs of Scottish FE and the quality of the content referenced within them has not been assessed with the needs of FE in mind.

The development of the IG reported here follows an initial period during which a group of FE subject specialists were seconded to SFEU, to identify and assess electronic resources. They then mapped these to SQA curriculum levels and indexed them in the IG, providing evaluated learning content for different subject areas within FE in Scotland.

Figure one shows an example resource description within the information gateway.

(Insert figure 1)

Figure 1 An example resource description within the information gateway

This paper presents part of our evaluative work for the development of the IG to better support the needs of its users.

### **Method and participants**

A representative group of 34 FE teachers (20 female, 14 male) took part in the study, whose subject specialities included Numeracy, Business, Management, Hospitality and Horticulture.

### **Telephone interviews**

Six of the subject specialists previously seconded to SFEU, and three who had used the IG in the course of workshops run by SFEU were interviewed by telephone. The purpose was to elicit the drivers and barriers to uptake of the IG through reflections on experience of its use and insight into the interviewee's attitudes to the use of ICT within FE. Participants were asked to refresh their memories by exploration of the IG during the days immediately preceding their interview. Each interview took between twenty and thirty minutes and, though sharing a common agenda, were semi-structured and open-ended so as to allow new themes to emerge naturally. All interviews were recorded, with the consent of the interviewee.

### **Observation of use**

Twenty-five subject specialists were observed using the IG for the first time during workshops run by SFEU. At these workshops attendees were given a high-level overview of the resource functionality by the facilitator. Each participant worked a networked laptop to explore the IG in their own way. The users were observed by the researcher, whilst they 'thought aloud'. The researcher intervened only when the user experienced difficulties and had tried to solve the problem by himself. A critical incident sheet was used to record key points in the users' interactions with the IG, each user also completed a usability questionnaire and underwent a post-session semi-structured interview that asked them to reflect upon their first-time use and enquired about the drivers and barriers to uptake of the information gateway. Finally, the researcher engaged in an open discussion with the attendees at the end of the sessions to capture any outstanding issues.

### **Results and discussion**

The telephone interviews were transcribed and analysed (using QSR NVivo) for evidence of perceived drivers and barriers to uptake of the IG, and positive and negative usage experiences. Interviews carried out after observing novice users were similarly analysed, together with the critical incident data. Table one presents the common themes that emerged. The table illustrates themes that were common across some or all user groups. Grey filling signifies shared themes. White signifies themes that were not emergent for that group.

(Insert table 1)

Table 1 The key emergent themes as a function of user group

### **Expert evaluations of networked learning resources lend confidence**

The issues that emerged from the research that were *common to all three groups of users*, had, first and foremost, a positive message. As a concept, the IG is favourably received by its target audience. If elearning resources are critically approved by subject specialists, there is a *greater* perceived likelihood of their being used in teaching.

... a very good idea, very interesting, assessing resources to some quality standard and matching it to the curricula.

The fact that somebody has actually taken time to go through the site and look at it, particularly when they are a subject expert provides me with much greater confidence.

More recent trials indicated that although subjective satisfaction with experience of the IG is generally high, there remains a concern that the material within the information gateway be of creditable provenance.

This provision of evaluated content within the information gateways comes at a price. The content needs to be catalogued and tagged with a short description that outlines the semantics of the resource (Recker and Walker, 2000). This needs to be done by members of the subject teaching community, for the resource to have potential value within that community.

### **Perceived effort and time constraints**

The amount of effort perceived by the user as necessary to either access or submit content through the IG was a critical issue, working counter to the need for a large corpus of content to be mapped to specific units and levels. Perceived lack of time to invest in learning to use the IG may underpin this reluctance, yet support could be managed through appropriate staff development. The HMI OFSTED report (2001) found that the incidence of ICT use in the support of learning and teaching was low, and this was confirmed in their college visits. Challenges might be addressed through development workshops, and via more formal secondment of FE staff to specific ICT projects, allowing resource developers to gain a greater insight to user community needs.

### **Specifying the granularity of learning objects**

Practitioners stated that resources be mapped not just against curriculum level (as they currently are) but more preferably against specific unit titles, thus specifying a preferred granularity. The smaller the educational resource, the higher its level of granularity (Casey and McAlpine, 2003). To provide this level of mapping between web content and the SCQF would involve considerable effort - for example mapping content to:

Electrical Fundamentals (title)

Intermediate 2 (level),

D132 11 (unit code)

XJ (superclass)

1 (credit value)

Thousands of courses exist in the SCQF framework - a key reason for the IGs to access a powerful bank of resources. Dowling (1998) comments that the disaggregation of learning resources into smaller 'learning objects' may contribute to a 'fragmented conception of any domain'. Conversely, FE as an educational community draws upon learning objects that are useful by virtue of their being disaggregations of larger structures. Casey and McAlpine (2003) cite the example of the flexible potential of a finely grained learning object - a water-pressure simulation that illustrates how water travels through a channel might be adapted to show how electricity flows through a wire. Within the context of FE, such a resource could feasibly be accessed from the IG, adapted for a specific teaching need, and then re-submitted to the gateway, having been 're-mapped' to reflect the newly created learning object's relationship to the curriculum. This adaptation of a disaggregated resource lends the FE educator the flexibility and scope to be creative in their choice of educational materials within the structure of an otherwise highly specified outcome-driven qualifications framework.

### **Unique value of curriculum mappings**

The fourth common issue was that the unique value of the IG as a tool to support quality evaluation of learning resources, and their mapping to the SCQF, is not immediately obvious to the practitioner community. A concern for FE staff is that even when there are resources on the internet in their subject area, they are either of poor quality, consist of promotional material, or are too abstract to be of use. Littlejohn (2002) comments on Higher Education shortcomings in instructional design involving web-based material may be reduced by offering a greater range of staff development support. This could be extended to FE, to develop the skills needed to identify and assess the quality of potential teaching material, or in creating web-based learning resources that are fit-for-purpose.

### **Conclusion**

Our study evaluated initial use of a tool that supports the assessment of resources for FE teaching and learning and maps them to the SCQF. This, in turn, supports their re-use by practitioners within the wider community. An overall favourable subjective response was received to the mechanism of formally assessing both the quality of a resource and mapping it to the curriculum, although staff development challenges remain with respect to promoting the uptake of the tool. Issues of 'usability' elicited through our study were addressed through revisions and retrialling over a period of development. The new version of the IG will be used for a series of staff development workshops to promote and develop use of the mapping tool, and extend use of internet resources, evaluated by subject experts, across FE subject communities.

One of the key facilitators of the uptake of the IG will be the development of subject specific 'learner guides'. Produced by subject experts, these expedite student access and use of elearning resources, and are learning objects in their own right, following key principles of good practice in web-based learning provision cited by Gibbons, Lawless, Anderson and Duffin (in press):

Direct interaction with the learning object: developing ways of allowing the student unimpeded access to source material.

Sequencing of activities: guiding the student through use of each learning object in an orderly fashion such that learning is maximised.

Goal-orientation: ensuring that the learner keeps sight of his immediate learning goals and understands how use of a learning object will help him to obtain that goal.

The next stage of our work develops and tests an on-line template for the production of learner guides by subject experts, accessible through the IG, the JISC-funded JORUM portal, and downloadable for use in courses across the FE and HE communities. Focused toward specified learning outcomes, achievable through teacher identified and evaluated content, encouraged and supported by the use of tools such as the IG's mapping functionality, learner guides can integrate within course designs that engage a diversity of learning communities.

*The work described in this paper is funded by the Joint Information Systems Committee (JISC) under its Exchange for Learning (X4L) initiative.*

## References

- Alexander W (1999), 'TALiSMAN Review of Staff Development Courses and Materials for C&IT' in *Teaching, Learning and Assessment*. Online at <http://www.talisman.hw.ac.uk/CITreview/>, accessed on 30<sup>th</sup> April 2003.
- Brown J S and Duguid P (1996), 'Universities in the digital age', *Change: The Magazine of Higher Learning*, American Association for Higher Education (AAHE), 28, 4, pp. 10-19.
- Casey J and McAlpine M (2003), *Writing and Using Reusable Educational Materials: A Beginner's Guide*. Online at <http://www.gla.ac.uk/rcc/staff/mhairi/>, accessed on 30<sup>th</sup> April 2003.
- Dearing R and The National Commission for Investigation in Higher Education (1997), *Higher Education in the learning society*. Online at <http://www.ex.ac.uk/dearing.html>, accessed on 30<sup>th</sup> April 2003.
- Dowling P (1998), *Sociology of mathematics education: mathematical myths, pedagogical texts*. London, Falmer Press.
- Gibbons A, Lawless K, Anderson T and Duffin J (in press), 'The web and model-centred instruction'. In Kahn B (ed) *Web-based Training*, Englewood Cliffs, NJ: Educational Technology Publications.
- Harris M H (1998), 'Is the Revolution Now Over, or has it just Begun? A Year of the Internet in Higher Education', *The Internet and Higher Education*, 1, 4, pp. 243-251.
- HMIE (2001), 'Information and Communications Technology in Scottish Further Education Colleges', *Aspect Report for SFEFC*. Online at [http://www.scotland.gov.uk/hmie/Pdf/01\\_02/further\\_education/ict\\_in\\_fe\\_colleges.pdf](http://www.scotland.gov.uk/hmie/Pdf/01_02/further_education/ict_in_fe_colleges.pdf), accessed on 30<sup>th</sup> April 2003.
- Harris R A and Higgison C A (2002), 'Institutional Readiness for Online Teaching and Learning', *A JISC Senior Management Briefing Paper*.
- Irvine H and Williams P (2002), 'Internet use in schools: an investigation into the experiences, abilities and attitudes of teachers and pupils in junior schools', *Aslib Proceedings: new information perspectives*, 54, 5-5, pp. 317-325.
- Littlejohn A (2002), 'New lessons from past experiences: recommendations for improving continuing professional development in the use of ICT', *Journal of Computer Assisted Learning*, 18, 2.
- Mason R (1998), 'Networked Lifelong Learning: Innovative Approaches to Education and Training Through the Internet', *ALN Magazine*, 2, 2. Online at [http://www.aln.org/alnweb/magazine/vol2\\_issue2/Masonfinal.htm](http://www.aln.org/alnweb/magazine/vol2_issue2/Masonfinal.htm), accessed on 30<sup>th</sup> April 2003.

- Mayes T (1995), 'Learning technology and groundhog day', in Strang W, Simpson V and Slater D (eds) *Hypermedia at work: Practice and Theory in Higher Education*, Canterbury, University of Kent Press.
- McAteer E, Tolmie A, Crook C, Macleod H (2002), 'Grounding communication skills development in practice' in *Networked collaborative learning and ICTs in higher education: The Edinburgh Papers*, SPIE publications, University of Sheffield.
- McAteer E, Matthew R, Macleod H, Plenderleith J and Adamson V (2003), *ScotCIT Communications and Information Technology Programme: external evaluation report*.  
Online at <http://www.shefc.ac.uk/content/shefc/qli/scotcitevaluation.pdf>, accessed on 30th April 2003.
- Merisotis J P (2001), 'Quality and Equality in Internet-Based Higher Education: Benchmarks for Success', *Higher Education in Europe*, 26, 4, pp. 589-597.
- Powell B and Davies S (2002), 'The state of ICT in Scottish FE colleges', ferl/Becta ISBN 1 85379 447 3.
- Recker M and Walker A (2000), 'Collaboratively filtering learning objects', *Chapter submitted to Designing Instruction with Learning Objects*, David Wiley (ed.).
- Ritchie J (2000), 'The Use of MANs Initiative: Achievements, Outcomes, Recommendations'. *SHEFC Report*.
- Steeple C and Jones C (2002), 'Networked Learning: Perspectives and Issues', Springer-Verlag.
- Watson P (2002), 'The role and integration of learning outcomes into the educational process', *Active Learning in Higher Education*, 3, 3, pp. 205-219.