

# Developing and sustaining a national learning-object sharing network: a social capital theory perspective

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This paper reports on a major (ongoing) development in the UK which aims to provide a national learning-object sharing network for teachers in the further and higher education sectors. The argument advanced here is that for such an innovative network to be successful – significant attention must be given to the social dynamics of the network. The social dynamics concern the actual patterns of object exchange, what barriers exist to exchange and what incentives are necessary to overcome these barriers. Social capital theory and work on social dilemmas are examined as a conceptual framework for addressing such issues. The conceptual framework developed here emphasises that issues such as trust and reciprocity are important before cooperation in the development and sharing of learning-objects can become effective. The paper also examines the potential of learning-object exchange as a mechanism for supporting and sustaining communities of practice.

Keywords: learning-objects, digital repositories, sharing, social capital theory, social dilemmas, communities of practice.

## Introduction

This paper reports on a major, ongoing, UK initiative aimed at developing and sustaining a (teacher) practitioner oriented digital learning –object sharing network. The Exchange for Learning programme (X4L) is funded by the Joint Information Systems Committee (JISC) and involves an investment of £6 million over a period of 4 years. The programme has supported thirty projects in two phases with most projects involving consortia of further education colleges (FECs) and higher education institutions (HEIs). Learning-objects produced by each of the X4L projects adhere to the IMS Global Consortium content package (IMS CP) specification and include metadata records that conform to the Institute of Electrical and Electronic Engineers Learning Object Metadata (IEEE LOM) standard. The learning-objects developed across the programme will be deposited in a learning-object repository, known as JORUM and made available to the FE and HE sectors. The X4L programme has addressed a range of demanding technical challenges but the focus of this paper is on the considerable social challenges that are inherent in attempting to develop and sustain a learning-object sharing network made up of geographically dispersed teaching professionals from a diverse range of educational institutions and academic disciplines.

According to Sir John Daniel (1999) any technological innovation involves both hard technologies (machines, computers, satellites..) and soft technologies (social processes, relationships, sets of rules..). Daniel argues that many attempts to introduce learning technology innovations fail, not because the hard technologies are inadequate or deficient but because too little attention is given to the soft technologies within which the hard technologies are enmeshed. This insight is supported by contemporary work on developing effective methodologies for information systems development (Bannon, 1994) and computer supported cooperative work (Nardi, 1996). To address the issues encapsulated by the phrase ‘soft technologies’ this paper argues that a useful analytical perspective is provided by a range of social-scientific work broadly concerned with the concept of social capital. Although there is no clear consensus about how to define (or operationalise) social capital the concept draws attention to issues such as: trust, reciprocity, relationships, networks, ties, cooperation. These sorts of issues are, according to the argument developed here, crucial to developing and supporting an effective learning-object sharing network.

## Overview of the X4L programme

JISC is a joint committee of the UK further and higher education funding bodies and is responsible for supporting the innovative use of information and communication technology (ICT) to support learning, teaching, and research. It is best known for providing the JANET network, a range of support, content and advisory services, and a portfolio of high-quality resources.

X4L is funded by JISC and has been motivated by the imperative to make the most of the considerable investment that has taken place in a range of content which has high potential value for use in learning both within the post-16 education and commercial sectors, and to bring these to the widest possible audience.

It is clear that teachers often do not use existing electronic collections in the classroom because the materials can't be easily adapted to fit the teacher's own curriculum needs and students' individual learning styles. Through X4L, JISC has funded projects for colleges and universities to produce case studies and exemplars that demonstrate how learning materials can be assembled and shared for use in multiple teaching and learning scenarios in a wide variety of educational environments using assets from larger e-collections. JISC is also developing prototype tools (including the JORUM repository) which can be used to build learning-objects and assessments into bespoke learning materials to be shared across the FE and HE communities. This work may benefit publishers by exploring new models of use of e-resources, offering a wider exposure of published e-collections within teacher and student communities, and stimulating demand in the further and higher education sectors for commercially produced e-resources as a basis for the creation of course materials.

X4L encompasses thirty projects from across the UK and involves more than 100 institutions and teams from colleges, universities, libraries, JISC services, local authorities and commercial companies. JISC will be providing the JORUM repository service to FECs and HEIs in the UK in the autumn of 2005. The JORUM repository will contain resources contributed by teaching staff themselves that can be subsequently used by other staff with their students i.e. learning materials, and resources that support teaching staff in doing their job, examples include: lesson plans, tutor guides and staff development materials. In recognition of the groundbreaking nature of the services to be provided by JORUM a parallel strand of research and development work will continue for at least the first three years of the service. The continuing research and development work will ensure that the JORUM service evolves in line with changing requirements as the FE and HE communities become more aware of the potential of sharing learning-objects and using repositories.

The aims of the X4L programme outlined above are ambitious and represent a considerable challenge especially as the learning-objects produced are to be made available across both the FE and HE sectors. In the past, these two sectors have not engaged in any significant way on learning technology projects and X4L marks a bold attempt to foster effective collaboration. Various tools and technological infrastructure have been developed, and continue to be refined, but perhaps the most significant challenges faced are those concerning the social processes or social dynamics (the 'soft technologies') within which learning-objects must be developed and used. The next part of the paper turns to social capital theory and the study of social dilemmas as a framework for illuminating aspects of the social dynamics of developing and sharing learning objects.

## **Social Capital**

Interest in the concept of social capital and its application to a range of issues has grown considerably over recent years (Field, 2003). In many respects the key ideas embraced by the concept are not new and in essence are quite simple – relationships between people are important and can provide an important resource for achieving valued outcomes. A useful definition is:

[s]ocial capital is a resource based on relationships among people. In particular, most definitions focus on membership in networks and the norms that guide their interactions. These in turn generate secondary features such as knowledge and trust, which then facilitate reciprocity and cooperation. (Kilpatrick *et al.*, 2003; p.419).

Although the above definition appears clear and unambiguous Kilpatrick goes on to elaborate some nuances of the definition and in particular the distinction between social capital as a resource for

“collective-benefit” and social capital as a resource for “individual-benefit” for those individuals who have access to it. For the purposes of this paper the focus will be on social capital as a resource for collective benefit and how, from this perspective, it can support collaboration and coordination amongst teaching professionals for mutual benefit.

The concept of social capital now regularly appears in academic journals and has been applied to a range of research domains including: education (Dika & Singh, 2002), economics (Knack & Keefer, 1997), health (Hendryx *et al.*, 2002) and crime (Rosenfield & Messner, 2001). Although many of the ideas (reciprocity, trust, cooperation) encompassed by social capital appear (at face value) to have applicability to developments in online/e-learning there is a relative dearth of empirical studies that directly employ the concept within this domain, Daniel (2003) is one exception. There are, however, a number of studies that make indirect use of the above concepts, notably: (Haythornthwaite, 2002); (Wellman *et al.*, 2001); (Jones, 1998). With regard to previous work within the domain of online/e-learning which makes use of concepts related to social capital that undertaken by Goodyear (2000) is of particular interest. Although Goodyear makes no mention of social capital he does make reference to the work of Kollock (1998) in examining social dilemmas and how this work might be of use in illuminating aspects of online collaborative learning. According to Kollock (1996; p.109):

One of the most basic questions in the social sciences is the problem of cooperation. In the face of temptations to behave selfishly, how might a group of people ever manage to establish or maintain cooperative relations? The character and qualities of this problem are different when groups use computer-mediated communication to interact, but the differences do not guarantee a uniformly positive effect or resolve many of the long standing problems of cooperation.

The next section of the paper examines in greater detail the concept of social dilemmas and begins to explore the applicability of this concept to a learning-object exchange network.

## **Social dilemmas**

In trying to encourage and sustain networks of cooperation, as the JISC is trying to do through the X4L programme and the JORUM repository, a fundamental problem is that of discouraging individual, selfish behaviour whilst encouraging group-oriented collaboration. The tensions that exist between these two types of behaviour have been studied extensively under the heading of social dilemmas. As Kollock (1998; p.183) states:

Social dilemmas are situations in which individual rationality leads to collective irrationality. That is, individually reasonable behaviour leads to a situation in which everyone is worse off than they might have been otherwise. Many of the most challenging problems we face, from the interpersonal to the international, are at their core social dilemmas.

As individuals we are each better off when we make use of a public resource, such as public television, without making any contribution, but if everyone acted on this conclusion, the public resource would not be provided and we would all be hurt. Each farmer does best by taking as much irrigation water as possible, and each fisher benefits from catching as many fish as possible, but the aggregate outcome of these individually reasonable decisions can be disaster – groundwater exhausted and fish species depleted to the point of extinction.

Two particular types of social dilemmas are seen as particularly pertinent to the current study – public goods and the tragedy of the commons. These two types of social dilemmas are examined, very briefly, in the following two paragraphs.

Public goods dilemmas involve situations where a product or service is available to all and offers benefits to all who use it but where people cannot be excluded from using the product or service once it has been produced. At the heart of this dilemma is whether an individual (or a group of individuals working collectively) should make the effort to produce something which they will benefit from but which will also be available to others. To put it crudely – why should I bother to produce a public good when there

is no guarantee that others will produce further public goods (from which I can then benefit) and where I may be seen as a sucker – making a contribution to something that is seen as a lost cause. Another way of expressing the public good dilemma, according to Kollock is to view the challenge faced by individuals as a ‘social-fence’ – to produce a public good an individual must incur an individual cost (the social-fence) and there must be sufficient perceived benefit to induce them to make the effort to climb over the social-fence. Because it is often difficult or impossible to convince individuals that it is worth their effort to climb-over the social-fence (i.e. to incur the costs of producing the public good) governments often take on the responsibility examples being – motorway networks, public broadcasting, state education. An interesting example of the successful production of public goods appears to be that of the open-source software movement where a product (for example the Linux operating system) is produced by, unpaid, global cooperation.

The tragedy of the commons refers to situations where a common resource is available to all and where the temptation is to exploit this resource to such an extent that everybody (including one self) is worse off over time because the resource can no longer support continued use. Examples of commons tragedies are readily observable in the modern world faced with ecological disasters – rain forests, the air, fish populations. Kollock (1998) refers to such dilemmas as ‘social-traps’ – participants must avoid the trap of overuse but may fail to do so in the absence of assurances that other users will also restrain themselves. There is a close link between maintaining the capacity of a common resource to support continued use and the production of public goods.

The two types of social dilemmas outlined above are seen to have a particular relevance to the work of the X4L programme and the JORUM repository. These two dilemmas focus attention on the social dynamics (the ‘soft-technologies’) that must be addressed successfully even if the ‘hard-technologies’ perform at the highest levels of expectations. If the kind of sharing that is envisaged by JISC via the JORUM repository is to flourish (and most lecturers confirm that this kind of sharing would be valuable) then using the ideas of social dilemmas directs our attention to trying to resolve the following issues:

- how can individuals and institutions be encouraged to incur the costs necessary to produce learning-objects (public goods) that will then be made available to the FE/HE sectors for the potential benefit of all?
- how can individuals and institutions be encouraged to interact (via the JORUM repository) in such a way that the value of the network (a commons) is maintained for the benefit of all?

The next section provides an overview of literature that is concerned with examining issues concerned with overcoming some of the barriers to effective cooperation mentioned above.

## **Overcoming social dilemmas**

The first part of this section draws further upon the work of Kollock (1996, 1998) and is directly concerned with offering potential solutions to social dilemmas. Following this is a brief overview of different ‘trading’ models that might be adopted to overcome the difficulties identified above and thus promote learning-object exchange. The final part draws attention to the work of Wenger (1998) on promoting communities of practice and how this might be applied to issues of learning-object sharing.

The solutions that Kollock offers for overcoming social dilemmas are derived from experimental studies conducted under laboratory conditions and their applicability to the current study must be treated with caution. However, some of the solutions offered are worth examining for their potential to help create a self-sustaining and vibrant learning-object sharing network.

### **Communication**

According to Kollock (1998; p.194) “a wide variety of studies [show that], when individuals are given the chance to talk with each other, cooperation increases significantly”. This insight may not seem very novel or significant (and it does bear the imprint of experimental studies on the prisoners’ dilemma) but it does reinforce the need for effective relationships – a point that is particularly important for the X4L programme as it tries to develop cooperation between institutions from two different educational sectors (FE and HE). Improving communication (both face to face and online) is one way of improving relationship building and contributing to social capital across the resource sharing network.

## **Group identity**

Where individuals have a strong sense of group identity cooperation rates can be significantly improved even in the absence of extensive communication. Again, this is not a startling revelation – most people feel more inclined to cooperate with those where they feel a bond or degree of affinity. The challenge for the X4L programme is how to encourage the development of some kind of group identity across such a diverse range of professionals working in different institutions, in different sectors and being physically distant from each other.

The next three ‘solutions’ are derived from work carried out by Axelrod (1997) investigating the two-person Prisoner’s Dilemma game. Again, it must be emphasised that this work is based on computer based tournaments carried out under experimental conditions. Although the research conditions under which Axelrod conducted his work are very different from the conditions of the X4L programme his conclusions may offer some guidance on addressing some of the potential difficulties faced by the programme.

## **Ongoing relationship**

If two people (as in the Prisoner’s Dilemma studied by Axelrod) have an ongoing relationship i.e. they will meet again, there is a greater chance of cooperation than if they meet only once or if they are meeting for the last time. It seems that this insight might have applicability to group dilemmas, such as the public goods dilemma, where I will have to face the consequences of my lack of cooperation through my ongoing relationships with other group members. What appears to be at work here is the dynamics of a developing norm – if sharing with other group members can be established as a norm I am going to feel increasingly uneasy about my lack of cooperation as I am constantly faced with my ‘deviancy’ through my ongoing dealings with the rest of the group. The key question here is: how can cooperation become established as a norm within an emerging learning-object sharing network? This is a question that is touched on in the next section under trading models for exchange.

## **Identifying others**

Where it is impossible to identify others and, as a corollary of this, one cannot be identified by others, the chances of cooperation are reduced. We are far less likely to share if we feel our selfish behaviour will be anonymous and we are more likely to expect such behaviour from others when we cannot attribute selfish behaviour to particular individuals. The implication here for a learning-object sharing network like JORUM is that sharing processes and systems should offer transparency and reveal information about the contributors and users of the network in an attempt to reduce anonymity.

## **Information about past behaviour**

Having access to information about the past behaviour of others as a way of promoting cooperation is strongly linked to the past solution – identifying others. If it is clear to me (on the basis of system data) that my colleagues in the network are keen to contribute their own resources as well as use resources provided by others the likelihood is I will feel more inclined to offer my own resources as well as use those provided by the group. Such information about past behaviour can also contribute to the development of sharing as a group norm as mentioned above.

The three ‘solutions’ above become particularly important when most interaction is online and the kind of data available to us about others becomes restricted when compared to face to face encounters. However, the potential of modern IT systems for gathering a range of data and presenting this in a variety of formats may offer considerable potential for ‘informing’ (Zuboff, 1988) aspects of learning-object sharing that would otherwise remain opaque. The notion of making visible otherwise invisible aspects of interaction within the context of online learning using virtual learning environments has been explored by Brosnan (2000) and may provide a useful perspective for reducing the barriers to effective cooperation within a learning-object sharing network.

## **Trading mechanisms for supporting resource exchange**

The phrase 'Learning Object Economy' has been used (Campbell, 2003) to describe the emerging patterns of use and reuse of learning-objects. The metaphor of an economy is an interesting and useful one – emphasising patterns of exchange within a common framework. Just as there are various types of 'financial economies' (free market, state-controlled, mixed, etc) so there are, potentially, various 'economic models' for supporting learning-object exchange. At one end of the spectrum is the radical 'free-market' approach advocated by Stephen Downes (2004) where there is no attempt to control the storage and distribution of objects and instead a completely distributed approach is adopted. Downes goes further in advocating that the phrase learning-resources, instead of learning-objects, be used as the latter is too ambiguous. At the other end of the spectrum are systems that enforce rigid control over the storage, description and distribution of objects via tightly controlled centralised, object repositories. The kind of 'economy' envisaged by the X4L programme is probably located at the midway point of the spectrum – a 'mixed-economy'. Within this model there is some centralised control exercised through the use of standards and work-flow processes embedded within the workings of the JORUM repository but there is also considerable scope for individuals to exploit the network in innovative (and perhaps unanticipated) ways. However, what is currently lacking from this model is any kind of explicit trading mechanism or, more precisely, an explicit reward/inducement mechanism for encouraging and rewarding learning-object sharing. Duncan (2005) has provided a brief overview of a range of trading mechanisms that could be adopted by a learning-object sharing network such as X4L. The most obvious such mechanism is direct payment – a contributor receives payment whenever one of their resources is downloaded from the repository. Other mechanisms include: tokens, bartering, royalties, franchising. One mechanism that Duncan doesn't mention (referring to it as a mechanism is, admittedly, stretching the meaning of that word) is altruism. The potential power of altruism can be seen in the open source software development movement, as mentioned above. One other of the mechanisms that Duncan refers to is 'tokens' and it is worth drawing attention to the use of such a mechanism for the last 10 years by the Scottish Colleges Open Learning Exchange Group (COLEG). The COLEG exchange mechanism is based on a give and get approach. Colleges contribute resources to a general pool and are then entitled to withdraw from that pool. The 'token' of exchange is based on the Scottish Qualification Authority (SQA) unit of credit – for each SQA credit 'deposited' a college is entitled to 'withdraw' 10 credits worth of material.

The potential of a learning-object exchange community to offer fresh insights and novel forms of pedagogy that transcends traditional disciplinary boundaries is captured by Anderson (2003):

The excitement of learning objects is not that we can now efficiently develop, classify, and distribute little bits of content. That is pretty ordinary didactics. The excitement is in developing the epistemological, pedagogical, and philological resources and strategies by which we can span the quadrants. Unless we do that, learning objects will not cross those boundaries (except in the acts of increasing semiotic violence of poaching, appropriation, and expropriation). That we develop only intra-disciplinary libraries of learning objects is not a bad thing. It is simply so much less than what could be. If we do develop these boundary spanning resources and strategies, there is a genuine opportunity for a critical revolution in knowledge production.

The kind of knowledge production and exchange envisaged by Anderson already occurs in informal and often un-noticed ways: over coffee in the staff-room, around the water cooler, as conversations in the corridor. Part of the challenge facing the X4L programme in attempting to promote an effective learning-object exchange economy is to transfer these informal, local, practices to a more formalised, distributed, environment. In attempting to promote knowledge exchange the JORUM repository service will allow teachers to indicate their own ratings of a learning-object, for example, teachers could give a learning object (say) a 3 for electronics at undergraduate year 2 and a 4 for physics at undergraduate year 1. The service will also allow for teachers to add their own thoughts about effective or innovative use of a learning-object by adding to the annotations field of the metadata record. These two mechanisms are an attempt to ensure that the exchange of learning-objects via the JORUM service remains a dynamic process with the learning-objects becoming 'active artefacts' (Sharpe et al., 2004).

The place of learning-objects as artefacts to promote the development and sharing of innovative pedagogic practice within communities of practice is explored in more detail in the next section.

## Participation through communities of practice

This final part of the discussion on overcoming social-dilemmas draws on the work of Etienne Wenger and in particular his ideas around supporting and developing communities of practice. The insights offered by Wenger are seen as particularly relevant to the efforts of X4L and the JORUM repository as the programme seeks to encourage the sharing of ideas and innovative practice as well as learning-objects. In this respect the learning-objects that are deposited and then reused by other professionals in different institutional contexts can be seen as boundary-objects (Star & Griesemer, 2003) offering opportunities for opening up dialogue about effective and innovative practice surrounding the use of the learning-objects.

Wenger uses the word 'reification' to refer to a broad process "of giving form to our experience by producing objects that congeal this experience into 'thingness'. In so doing we create points of focus around which the negotiation of meaning becomes organized" (1998; p.58). Wenger goes on to emphasise that his use of the word reification emphasises "making, designing, representing, naming, encoding, and describing, as well as perceiving, interpreting, using, reusing, decoding and recasting" (p. 59). Wenger's analysis of reification is mentioned here because it appears to have particular relevance to the process of creating metadata for each of the learning-objects deposited in the repository – a process that can be seen as encoding meaning within the learning-object. The process of creating such metadata for learning-objects is not trivial (Currier *et al.*, 2004) and this may be (partly) due to the very dynamic and experiential knowledge involved i.e. how does one use a learning-object effectively to support learning. One particular project within the X4L programme, Learning to Learn (L2L), has been investigating the potential of learning-objects to act as boundary-objects and whether, used in this way, they can contribute to overcoming some of the potential barriers to sharing. It has been argued that boundary-objects have the potential to address "the problem of common representation in diverse intersecting social worlds" (Star & Griesemer, 2003; p388)" and this insight might be of particular value given the diversity of participants sharing via the JORUM repository. In conceptualising learning-objects as boundary-objects their significance as resources for promoting dialogue across diverse social contexts and thus acting as a kind of 'seed-crystal' for the dissemination and sharing of ideas about effective or innovative practice is emphasised. The proposition offered here is that if it is possible to find a way to encode aspects of teaching knowledge along with the resources making up the learning-object itself then, perhaps, a further dimension can be added to the process of sharing learning-objects. This further dimension has as its focus the promotion of professional development and may provide a further inducement for individuals to engage in exchange. Wenger notes that a number of factors are important in trying to initiate and sustain a community of practice but asserts that:

what makes them successful over time is their ability to generate enough excitement, relevance, and value to attract and engage members. Although many factors, such as management support or an urgent problem, can inspire a community, nothing can substitute for this sense of aliveness. (Wenger *et al.*, 2002; p50)

The final part of this paper examines the considerable challenges faced by the X4L programme in attempting to overcome the barriers to effective collaboration and creating a supportive community of practice via that JORUM repository.

## Emerging issues from the X4L programme.

The work of the X4L programme is still ongoing with project funding continuing until October 2006. Phase 1 projects are coming to an end in the latter part of 2005 whilst a small number of phase 2 projects are just starting. During the autumn of 2005 the JORUM repository service will become operational allowing, first, contributors to upload learning-objects for sharing and then, toward the end of the year, users to download available objects. Currently no empirical data is available about the actual patterns of sharing or whether barriers to sharing have proved so significant that effective exchange has proved impossible. However, two interview surveys have been conducted (one at a programme level the other at project level) and the data gathered as part of these surveys provides some insights to attitudes about the potential challenges and benefits of learning-object exchange. The first survey was conducted as part of a review of the X4L programme in spring 2004. The second survey was undertaken as part of the L2L

project through a series of semi-structured interviews conducted during spring 2004 as part of the ongoing evaluation of the project.

## **X4L review**

The review was conducted by an external consultant via a series of interviews with each of the X4L project managers. The topics to be addressed as part of the interview were distributed to participants in advance of the interview. The replies received provide some clarification regarding the ideas about overcoming social dilemmas mentioned above.

### *Promoting group identity, communication and ongoing relationships.*

The X4L programme has tried to promote collaboration and communication through various innovative aspects of programme management. Most projects involve consortia of both FE and HE institutions – a new development for JISC funded projects. All projects were assigned to cluster groups on a geographical basis. The cluster groups allowed project staff to meet with others involved in the programme even where the other projects in the cluster group had a radically different focus. The cluster groups provided a valuable opportunity for the exchange of ideas and the forging of relationships that might not otherwise have developed.

### *Encouraging a culture of sharing*

Many respondents reported that they felt a greater culture of sharing existed amongst FE staff than was the case amongst HE staff but there was not a lot of experience in either sector. Most respondents indicated that they thought barriers to sharing existed mostly at the institutional level – sharing between institutions was very limited. Barriers to sharing at the individual level appeared to revolve mostly around issues of IPR i.e. whether the individual lecturer ‘owns’ the resource or whether ownership resides with the institution, a situation that was more significant in HE than FE. The need to promote the development of (and subsequently to sustain) geographically dispersed communities of interest was identified as an important contribution to encouraging sharing as a norm within and across both sectors.

### *The costs of producing public goods*

A concern raised by a number of respondents was the likelihood of institutions adopting a ‘defensive’ position and refusing to share learning-objects via the JORUM repository. This concern was more prevalent among respondents from HE institutions and related to the threat of potential loss of income from the deposited objects. Once the objects are deposited in the repository they effectively become public goods and it is not possible to exclude JORUM users from gaining free access. Respondents indicated that further top-down support (from funding providers) and explicit incentives would be needed to overcome this attitude.

### *Promoting cultural change*

Many respondents indicated that producing and sharing learning-objects in the way envisaged by JISC would require cultural change across both the FE and HE sectors. Current forms of learning resource development are still individual lecturer oriented focused on meeting their local, deeply contextualised needs. The shift to a development model that emphasises open resources and sharing will require significant change – both at individual and institutional levels. Respondents mentioned effective staff-development interventions and freeing up quality time as key issues.

## **L2L project evaluation interviews**

The Learning to Learn project involves five institutions in central Scotland – one HE institution and 4 FE colleges. The project is developing learning objects focused on supporting adult learners develop effective learning and study skills. In addition to producing a range of learning-objects the project is also investigating the use of a common framework for expressing pedagogic intent and whether including this encoded pedagogic intent (as part of the metadata associated with a learning-object) promotes or adds value to the process of sharing resources with distant colleagues. In this respect the learning-objects are being investigated for their potential to act as boundary-objects and promote the exchange of ideas across diverse communities of practice. Participants in the L2L project were interviewed as part of the ongoing, formative, evaluation of the project and below is a brief summary of some of their responses.

### *Using learning-objects to exchange ideas about pedagogy*

There were mixed reactions to the notion of using learning-objects as a way of sharing ideas about pedagogy. For those participants not directly involved in recording ideas about pedagogy as part of the learning-object metadata there was generally a positive response – these respondents thought this was a good idea and would enhance the processes of sharing. In contrast, those participants directly involved in encoding their pedagogic ideas found the process time consuming and expressed doubt about whether this approach would encourage effective sharing. A major difficulty mentioned was the simple lack of time to engage in what was seen to be a rather abstract and ‘woolly’ activity. As one participant responded:

You can see from the project's perspective and also the fact that it's being led by a university, where their slant is coming from, whereas in FE, it's a sort of get your sleeves up and get the job done, you don't tend to sit back and reflect on a lot of things, and that's why I was saying initially that the project was a bit unusual, it's not the way we tend to be driven and we are usually quite faster paced and we don't have the time to sit down and reflect on these particular aspects. I'm not sure that it's as useful as actually doing something and getting something done.

Other participants did respond positively to the idea of sharing pedagogic expertise via learning objects:

But having said that, it certainly is useful if prior to using a learning object, people [rather than going into it blind] often within the college if they're using something would ask somebody else, "have you used this before, is it any good, how did it work". If that type of tutor note is already available, then that can help support the use of the learning-object RLOs. I always think it's useful to look at what other people have done, gain from other people's experience. Yes, pick other people's brains, get the best parts, ideal.

## **Conclusions**

The X4L programme and the associated vision of sharing learning-objects via the JORUM repository is an ambitious one – particularly as the repository will be available to both HE and FE institutions. Although many of the challenges faced are technically demanding the argument offered here is that key challenges relate to the social dynamics of learning-object sharing – what Daniel (1999) calls ‘soft-technologies’. In an attempt to draw attention to the social dynamics surrounding learning-object sharing this paper has drawn upon social capital theory and in particular the notion of social dilemmas as presented in the work of Kollock (1996, 1998). This work demonstrates how rational behaviour at the individual level can lead to disastrous results at the group level. By examining learning-objects as ‘public goods’ and the provision of an object repository as a ‘commons’ the applicability of the research (on resolving social dilemmas) to learning-object sharing via the JORUM repository becomes apparent. The empirical analysis offered is only able to offer very tentative conclusions, as the JORUM repository service has not yet gone live, but it does point to the considerable cultural changes that are necessary in both HE and FE if the kind of sharing envisaged is to become a reality.

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