

Is there a role for online repositories in e-Learning?

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1. EXECUTIVE SUMMARY

1.1. Background

Many universities across Europe are introducing, or thinking of introducing, an online repository for learning and teaching materials. Evidence from development projects in the UK suggests that tutors are willing to share resources with each other. Yet they do not at present make much use of online repositories. Why is this? What can be done? Are repositories a good idea? Our article will explore and answer these questions.

The authors together lead a project called "Developing Repositories at Worcester" (DRaW) funded by the UK Joint Information Systems Committee (JISC).

1.2. Why are tutors reluctant to use online repositories for learning resources?

Evidence gathered from over 30 UK JISC-funded projects in a 2007 report indicates that tutors in Higher and Further Education in Britain do not yet actively upload their teaching resources to e-repositories to share with others. This has been our experience at Worcester. Yet evidence from our project, and many others, indicates that staff are nonetheless willing to upload and share resources; indeed, many teachers already do share resources with each other, usually with close colleagues, usually by informal means.

Many universities have successfully introduced online repositories for research publications, and though staff have needed encouragement to upload and publish their papers, universities have nevertheless started to build substantial collections. At Worcester we have seen the development of a research repository engage lecturers far more successfully than our learning and teaching materials repository. This perspective has made us aware of the considerable differences in their use. We conclude that it is not suitable to use the same kind of repository for learning resources and considerable re-thinking of design, accessibility and functionality is needed.

Some have suggested that the reasons for the poor uptake in use of learning materials repositories lie with cultural, legal and organizational issues. We would agree. But we go further than this and propose that the design of the repository itself needs to change to meet users' needs.

1.3. The value of online repositories

There are tremendous benefits to a university in managing and sharing its e-learning resources and a central online repository can be a highly effective part of the university's management strategy. However, in this paper we suggest that tutors need an approach which fits more closely to the way they work, better represents their attitudes to sharing and differentiates between resources from different sources. So yes, there is a role for repositories in e-learning, but universities need to re-think their design and how they are used.

2. SHARING E-LEARNING CONTENT IN THE UK

2.1 Overview of JISC projects

A recent report: 'Sharing eLearning Content - a synthesis and commentary' (Charlesworth, et al, 2008) was prepared for the Joint Information Systems Committee (JISC) to collate concerns and issues from 30 UK repository projects. A brief summary here of the key findings from this report will help to illustrate the current picture in the UK with regard to the sharing of learning and teaching materials through repositories.

The report says that whilst developing suitable technology to enable the sharing of teaching resources is imperative, there has been a tendency amongst projects to seek technological solutions and put these in place first, before institutional commitment or analysis of user requirements has taken place. Further underlying issues are the concerns, uncertainties and misconceptions about copyright law, ownership and IPR (intellectual property rights).

The evidence shows that rather than large-scale sharing, via repositories, there is instead much small-scale sharing amongst colleagues and groups with whom collaboration is required and usually via email or personal websites.

2.2 The main concerns

The authors of the report concluded that the main concerns seem to lie in the areas of **cultural, legal and organizational issues**. These might be the reason for poor uptake of use of repositories. Amongst the cultural issues, authors of learning materials expressed a wish for original authors to be attributed, if their materials were shared, but few were concerned that their institution be attributed, even though in most cases the institution was the actual copyright owner.

The report noted that learning object repository (LOR) design should reflect the needs of the user, for instance, through the adoption of web 2.0 functionality and behaviours. (Milligan, 2007)

It was also further affirmed in the report that tutors are indeed willing to share e-resources, but that willingness depends on 'who with' and 'how' (Bell and Rothery, 2006)

Where organizations are concerned, there is the suggestion that, at a more strategic level, management of change issues need to be addressed and the implications of e-learning for managers considered. For instance, how will institutions need to administer teaching and learning, together with the wealth of resources in existence in the future, to avoid wastage?

Amongst the legal issues many grey areas seem to be present concerning intellectual property and ownership. For instance, does a lecturer who has created a PowerPoint presentation have the right to upload it to the web to allow others to use it? As pointed out in the report traditional practice is often contrary to the legal situation and both managers and teachers are unclear (Bell and Rothery, 2006) Whilst academics may wish to comply with copyright law they are often frustrated with the complexity of the processes involved. Provision by institutions of appropriate policies and effective guidance for staff is seen as a significant problem to be addressed, in order to prevent barriers to the adoption of institutional repositories for sharing resources.

2.3 Trust and communities of practice

The issue of trust is an important factor identified by the authors of the synthesis report. A number of the projects reported that people were far more inclined to share with those they knew through collaboration or reputation. Trust need not be through a personal relationship, this report suggests, but can be developed within a service, subject discipline or publication, or a learned society or community. The role of communities of practice (Wenger, 1998) with an emphasis on the 'practice' (Brown, and Duguid, 2001) needs to be considered carefully. Brown and Duguid discuss practice as "undertaking or engaging fully in a task, job, or profession": a notion which seems to be an important binding factor in the sharing of the teaching materials created.

Further research is recommended to compare the similarities and differences between practitioners' attitudes towards sharing their research and sharing their teaching materials. This needs to focus "on the roles played by and the potential for incentive, reputation, attribution, approbation and trust." (Charlesworth, et al, 2008)

2.4 The value of managing and sharing resources

Within the UK there is great awareness of the value of managing and sharing resources despite the uncertainty of the best way of achieving it. In April 2008 JISC published guidelines in a briefing paper 'Managing and Sharing e-Learning Resources: How repositories can help' (Rothery, 2008) to all UK universities, higher and further education institutions, promoting the benefits of managing and sharing resources. These include:-

- Saving time and cost by re-use
- Making better quality resources available to tutors
- Supporting collaborative course development both within institutions and across institutions
- Giving access to outputs of development projects
- Supporting the transfer of institutional research and enterprise knowledge for learning and teaching
- Coping with situations where staff leave and are replaced
- Developing good professional reputations for individuals and institutions within the further and higher education (FHE) sector

In its summary the Briefing Paper recommends three major directions for taking development forward:-

The strategic vision: publishing and implementing the agreed institutional policy and approach to sharing and re-using online resources, both locally and externally.

The legal framework: defining ownership, copyright and IPR in a way which protects the organisation's assets yet allows open sharing within the educational community.

The online systems: identifying the different kinds of systems for sharing and re-use both locally and externally; providing and developing the use of institutional systems and repositories which meet tutors' immediate practical needs, yet also exploit the benefits of managing, sharing and re-using resources.

2.5 So why are repositories for teaching resources not yet widely used?

There are clear benefits to managing and sharing resources, and tutors are willing, in many cases, to share. However, repository use is not widespread. Is this because of cultural or legal concerns? Or is the design of repositories unsuitable for this purpose?

3. DIFFERENCE BETWEEN RESEARCH AND LEARNING MATERIALS REPOSITORIES

The success of online repositories for research publications has led universities to use similar systems for storage and access of teaching materials. Yet tutors are reluctant to use such systems. You yourself may have set up such a repository only to find it remains virtually empty. Is it because tutors need time to adjust to a new way of working, or is it that the system itself is unsuitable for the purpose? To help understand this question it is useful to recognize that using a repository for research publications is very much different from using one for educational materials. What are these differences?

- **Making material public.** Lecturers want their research papers seen worldwide, indeed they wish to see their work promoted and publicized. There are many incentives for developing a list of academic publications: academic reputation, promotion, institutional policy, etc. However there are few such incentives to publish teaching materials unless in the form of a textbook. Indeed many lecturers wish to restrict access to themselves or their close colleagues.
- **Metadata.** Practicing teachers might need a different type of metadata, and often find the formal style in research repositories inconvenient and burdensome for teaching materials. For example, tutors might prefer to classify their material under course title, and subdivide by course topic, like they do in the virtual learning environment (VLE). Or perhaps they wish to use subject topics and titles relevant to their own work such as “statistics”, “study skills”, “byron’s poems”, “differential equations” etc.
- **Versions.** Research papers are usually discrete entities, each is a single finished product. If there are several versions the version history will be very clear: preprint, publication, postprint. Many different versions of an individual learning resource may exist, alternative versions in different courses, versions updated from earlier years; some versions replacing earlier ones, some simply variations.
- **Audience.** Academic publications are intended to be read by other academic staff and researchers, and they can access them directly from the repository. However learning materials are of course intended for students. The materials will generally be delivered to students through a different online system such as the VLE, or a web page. In some cases the tutor has to download the resource from the repository and then re-upload to the student system, or put the url to the resource. Students would not normally have access to the repository itself, just the resource. This adds complexity to the way tutors have to work.
- **IPR, re-use, citation.** Tutors have relatively clear understanding of copyright and IPR rules for scholarly work, and there is an agreed framework for citation and re-use of publications. In the case of learning materials, many tutors are uncertain about IPR, they are unsure if they are allowed to repurpose a particular resource, there is no agreed framework for this.
- **Types of material.** Collections of learning materials arise in different ways. Some will be created by individual teachers, their personal work. Some may be resource collections such as a collection of digitized photographs for a particular course, a collection of sound recordings for departmental use, a collection of students’ work, or past exam papers. Some resources may have been purchased by the institution commercially. Some materials may be the output of a curriculum development project. So there is considerable variety both in the source of the material, its ownership, how it is used and its format. Scholarly publications are of a more consistent type and format.
- **Retention.** There is a tradition of preservation and archiving of academic publications whereas little awareness of any need to retain and archive teaching materials. Perhaps individual teachers may keep old copies of their materials, but even this is not common, and it is a matter for discussion whether there is indeed any value in preserving old materials at an institutional level.
- **Peer review.** Scholarly works are often subject to peer review or quality assessment prior to publication. This is not the case with learning resources. Indeed it is a matter of controversy how one might assess quality, as learning resources can be used in many different ways, and its value is very much dependent on how it is used. Authors would probably welcome feedback from other teachers, though this is a different form of feedback from that which you would obtain say from an editorial board on a research journal.

Finally, evidence from universities, some of it mentioned in this paper, shows that it is far easier to encourage **uptake and engagement** with research repositories than with those for learning resources. Since there are so many differences in the way repositories are used, perhaps it is hardly surprising. It is the view of the authors that the poor engagement comes from the nature of the repositories themselves, they do not function in a way which reflects the particular way teaching and learning materials are used. Some re-thinking of their design is needed.

4. DEVELOPING REPOSITORIES AT WORCESTER PROJECT

4.1 DRaW Project

DRaW (Developing Repositories at Worcester) <http://www.worc.ac.uk/drawproject/> is a current JISC-funded project, with the aim of providing an open integrated e-repository service to support all aspects of the work of academic staff at University of Worcester. A significant component of the project is to develop ways to embed repository use into institutional procedures and workflows, so that it becomes a natural part of the working approach adopted by academic staff. The work of the project is divided between the development of an institutional collection of research and publications, which is known as WRaP (Worcester Research and Publications), using EPrints software, and the extending of an already established learning and teaching materials repository, known as CoRE (Content Repository). CoRE software is being adapted at Worcester to reflect feedback from academic staff.

4.2 Our survey

During Autumn 2007 a short survey was placed on the University of Worcester Blackboard VLE to ask the opinion of teaching staff on the sharing of teaching resources. This was intended to gauge interest in the use of our e-repository (CoRE) for learning and teaching resources, where staff could upload items to share and download the resources of others that they might re-use. CoRE has been available for three years for staff to use in this way, yet interest has been slow to develop.

Norm Friesen, in 'Online Education Using Learning Objects' (Friesen, 2004) discusses the fact that governments around the world are spending large sums of money on initiatives that promise the development of learning objects, learning object metadata and learning object repositories to store both this data and these objects. However, he points out that more open discussion of both positive and negative aspects of this approach are needed and that the vision of sharing educational resources needs to be made more relevant to the work of learning practitioners and to learners themselves).

Whilst e-repositories for the purpose of sharing teaching resources do not seem as yet to have been widely embraced, our survey does indicate that tutors at University of Worcester are quite willing to share and also reuse resources.

4.3 Summary of results of the survey

Staff were asked what type of teaching resource they would find useful, if available in a searchable collection.

79% said copyright free images

68% copyright free videos.

61% said other people's Powerpoint Slides that they might re-purpose would be useful.

61% said interactive templates that could be adapted

48% said generic team building exercises

40% opted for sound files

40% said generic ice breaker exercises

37% thought miscellaneous quizzes would be good.

Staff were then asked 'would you be likely to search such collections for resources to use in the class and via Blackboard?' 97% said yes, they would and just 3% said no.

When asked, 'would you be willing to submit any of your resources for others to share and adapt?' An astonishing 89% said yes, they would, whilst just 11% said no.

People were asked if they might like to try saving their lectures as 'podcasts'. Again the results were fairly high, with 66% saying they would and 34% saying they would not be interested.

It seems that in principle our staff do see the sharing of resources as a good thing and would like to access a range of resources where copyright concerns do not inhibit use.

4.4 Some conclusions from the survey

It is clear then that a variety of resources, if made available, could appeal. Most staff in this sample said they would be likely to search such collections for resources to use in the class and via Blackboard and 89% said they would be willing to submit resources for others to share and adapt.

Whilst it appears from the survey conducted that staff do not have major objections to sharing or re-using useful materials, the question of how they might do this is more complex. We need to consider what factors may be preventing this from being an active process through e-repositories. The upload and tagging of resources to a separate e-repository is not part of the current workflow for staff and a new approach may be required that considers the way in which tutors *actually work* in order to see the points where sharing and re-using resources might be introduced.

4.5 Observations on current practice

The Blackboard system is now widely used by teaching staff at Worcester and most resources are placed there, or on linked web pages or blogs. This may not be the most convenient process, but it has evolved as the universal practice within our institution. When tutors need to share resources they have the option to email them to each other, or to enable a colleague to look at their modules in Blackboard and download whatever they wish. Advantages are that resources can also be seen in context within Blackboard, which may be helpful for re-use. Disadvantages are that the resources are module-based and are not searchable generally by staff. Indeed even for staff teaching on a particular module within Blackboard it is easy to lose a resource within the many folders and spend time looking for it amongst all the weekly topics or the files area which appears as one long list.

However, as most VLEs do work on the principle of storing content within folders, there is a key difference here in that repositories intended for learning and teaching materials do not adopt a similar structure. Lecturers, when confronted with a separate repository system, can see no incentive to upload resources that they already spend time uploading to Blackboard. Individual discussions though have confirmed that, were a copy of a resource to be sent to the repository automatically, as part of the Blackboard upload process, thereby adding no extra staff time or separate login procedure, then in principle there would be few objections.

It seems that the VLE has become our 'repository' and is used by both individuals and groups with whom they have connections. The 'sharing' seems to take place as and when circumstances require it, such as one lecturer taking over the module or course of another, or a group collaborating in the running of particular modules within a subject area. Where wider sharing has been sought, for instance amongst the staff and students of an entire department, standard courses have been adapted within Blackboard by our Systems staff to allow this. Such workarounds have enabled most departments to enjoy a shared area to meet their administrative needs for document sharing, announcements and course handbooks. How sustainable such solutions are though in the longer term is one question to be addressed. A further complication is that to meet demand Blackboard courses are now archived within Blackboard so that staff can look back over several semesters at the resources within them. Such managing of content within the VLE could present problems in the future. VLEs are not designed for resource storage and management. Repositories, if appropriately designed, could offer a potential solution.

5 WHAT WE DID

5.1 Changing repository functionality

In response to staff feedback, we considered how the CoRE repository software might be modified to allow tutors to choose whether they would wish each resource they upload to CoRE to be searchable by other staff, or visible only to themselves within CoRE. When a resource is submitted to CoRE the staff member is required to add metadata to identify it when others try to search for it. Figure 1, below, shows part of the screen where these details are input and indicates with arrows the changes made by the developer to allow staff both to restrict access and then choose the individual staff they would like to allow access to.

Discipline BUSINESS	Required <i>Discipline is the top level categorisation of a subject. Curricula is the discipline Electronic Engineering is the Curriculum.</i>
Curriculum Information Technology (IT)	Optional Restrict access to individuals <ul style="list-style-type: none"> No- all staff can browse and find this resource Yes- you can choose who can browse and find this resource,
Restrict Access <input type="radio"/> No <input checked="" type="radio"/> Yes	Allow access to: S.HAYES A.ROTHERY V.BELL
Add userid manually <input type="text"/> Add=>	<input type="button" value="Remove"/>
Search Database <input type="text"/> Find User	
Select userid and click Add: <i>Note: Only users that have completed 'My Details' will be returned</i> J.HILL APRIL SMITH VHEARN L.STOLPER D.BASTABLE	
<input type="button" value="Submit"/>	

UK LOM Metadata Scheme

Figure 1: the submission screen within CoRE where metadata is added

5.2 Web 2.0 style changes

The intention was to adopt a similar approach to some of the web 2.0 technologies, which allow different social networking groups to collaborate and share information online by choosing who they wish to invite to a particular community. The participatory nature of this, allowing staff to decide the degree of ownership over their own resources is intended to provide flexibility. However, in allowing staff to actively prohibit others from searching their resources it is hoped that tutors will also consider how many resources they do in fact have that they really would mind other staff having open access to. By default the 'restrict access' function is set to 'no' so that it becomes a conscious decision to either exclude all staff from viewing the item, or select only those preferred colleagues.

Feedback is currently being sought on the new CoRE features that will also allow us to consider any further changes that may need to be made to the system. This facility has been demonstrated to groups of staff and will also be discussed at an external event the DRaW Project is hosting in May 2008 entitled: 'Using repositories for learning and teaching: is there a recipe for success?' This meeting is intended to bring together those whose projects are currently trying to establish and develop repositories for learning and teaching resources. The main themes for discussion will be:-

1. differences between research repositories and repositories for learning and teaching
2. the slow take up for this type of repository
3. consideration of whether a different design or approach may be required

In discussing our common experiences at this meeting we will also seek to establish some solutions for the future of using repositories for learning and teaching materials and publish our findings in a report to further inform this area of research.

5.3 Collections

Another emerging use for our repository for learning and teaching is to hold particular 'collections'. These include at the moment:-

Undergraduate student dissertations. These are not all yet submitted electronically, but where they are, they may be uploaded to our CoRE system to allow a link to these to be placed in our Library catalogue. This allows students to search for them and see example dissertations and the feedback they received.

Course handbooks. All departments have course handbooks which they provide for their students to inform them of regulations and procedures for their subject area. When stored within our content repository links can be provided to any number of locations whilst the resource itself remains in the one online store.

Media files and podcasts. Staff usually seek assistance from a member of the university e-learning team when producing such innovative resources as podcasts and recordings and this is a good opportunity for the potential of the CoRE repository to be exploited.

External collections. The possibility of transferring small collections of searchable resources from other repositories has been considered. In building and providing a number of useful collections within CoRE staff might better appreciate the value of the repository concept.

5.4 Conclusions

In summary, our CoRE repository is not, as yet, well populated with resources, though it has been available now for three years. It still does not readily occur to most of our tutors that they might keep all of their teaching materials within CoRE and use links to these from other systems, including Blackboard.

We also believe there are significant differences between the way staff approach repositories for learning and teaching materials and those for the dissemination of research papers. We are finding that whilst staff readily upload their research to WRaP there is no incentive to upload their teaching materials to CoRE, as Blackboard is already used as a module-based repository of teaching resources.

Yet now that lecturers have an established workflow of uploading their resources to a virtual learning environment there is no wish to impede or hinder that process. Rather, we would build on tutors' willingness to upload and share but try to make progress towards a repository model. This would encourage a university's collection of teaching resources to grow and be actively shared and re-used but to be acceptable, the approach taken needs to complement some tutors' existing working practices.

6 THE ROLE FOR ONLINE REPOSITORIES IN E-LEARNING

There are tremendous benefits to a university in managing and sharing its e-learning resources and a central online repository can be a highly effective part of the university's management strategy. However, we suggest that tutors need an approach which fits more closely to the way they work, better represents their attitudes to sharing and differentiates between resources from different sources.

How to achieve this? There is no simple answer. However we can say that it would be naïve to use repository software designed for academic publications and without much modification, make it available for learning resources. We suggest that serious attention is given to the issues we have highlighted in our paper. Each university will have its own approach and will need to ask its own questions. But here are examples of advice to be considered:

- Develop suitable sharing systems so tutors can decide who should have access to each resource they create.
- Re-think the approach to metadata. Allow tutors to categorise their resources in their own way, perhaps in a manner similar to “tagging” in Web 2.0 applications. They might not find the global classification schemes useful, but prefer a simpler approach which allows them to use their own headings.
- Distinguish between material created by lecturers themselves and collections of materials developed by project groups or central resource units, for example audiovisual material. In some cases resources are clearly managed or owned by the institution, in others by the tutors.
- Develop an institutional strategy for IPR and copyright so that staff are clear about ownership and re-use rights
- Take account of the fact that the e-resources in the repository will actually be deployed to students through a virtual learning environment or some other kind of online system. Ensure that staff can easily transfer or link between material in the delivery system and the repository without substantial extra work involved.
- At an institutional level, articulate the overall strategy for management and sharing, the legal framework and the design and functionality of the online systems introduced.

So yes, there is a role for repositories in e-learning, but universities need to re-think their design and how they are used.

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