

# From institutional repositories to personal collections of learning resources

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## Abstract

*Institutional digital repositories are a basic piece to provide preservation and reutilization of learning resources. However, their creation and maintenance is usually performed following a top-down approach, causing limitations in the search and reutilization of learning resources. In order to avoid this problem we propose to use web 2.0 functionalities. In this paper we present how tagging can be used to enhance the search and reusability functionalities of institutional learning repositories as well as promoting their usage. The paper also describes the evaluation process that was performed in a pilot experience involving open educational resources.*

## 1. Introduction

Nowadays, institutional digital repositories are a basic piece of the technological infrastructure of any educational institution, serving two main purposes: ensuring preservation and promoting the reuse of the resources in the repository. Nevertheless, as digital repositories have been designed, created and maintained following a top-down approach (i.e. by librarians and IT staff), preservation prevails over content reusing, thus impairing its potential usage. Furthermore, resources are organized and described using institutional policies which might not be fully understood by non-expert users, thus causing confusion when browsing and searching for resources. On the other hand, most institutional repositories are deployed using DSpace as the underlying technological solution, which is well known for being a solid and stable platform but, at the same time, its user interface is far from being usable and engaging. Finally, if the only service available at the repository when a resource is located is downloading it, the user is left alone with the resource and all the possible reuses of such resource are lost, in the sense that there is no way to provide feedback about such usage.

Learners in a virtual learning environment see the institutional repository as an independent service, which can be integrated into the virtual classroom up to some extent. But seamless integration is not always positive. If teachers use the repository as a back-end to store and organize the resources used in a course, such organization is only visible within the virtual classroom itself, thus limiting its usage to the students enrolled into the course. Furthermore, once the students finish such course, they usually no longer see the virtual classroom, so they lose access to the resources they used to employ during their learning process. Learners are, in fact, expelled from a walled garden they used to be part of. This is one of the major drawbacks of virtual learning environments

when they are thought as a whole; learners have not the possibility to rearrange the available services in order to fulfill their needs outside these collection of walled gardens they belong to for a specific period of time.

In this sense, the ideas behind Personal Learning Environments (PLEs) may be very useful. As stated by Attwell (2007), "...learning is continuing and [a PLE] seeks to provide tools to support that learning". Learners should be able to organize the resources they consume (and produce) during their learning process according to their own criteria, not constrained by any institutional policy. Furthermore, searching, filtering and organizing information are basic competences for the Information Society. Quoting David Wiley, "we live in an age of content abundance", so intending to provide learners with all the useful resources about a subject or topic is a complete fallacy. On the contrary, we need to promote resource discovering, management and sharing among learners pursuing similar learning goals, shifting from a content-based learning paradigm to a connectivist one (Siemens, 2005), where learners are able to create their own networks containing services, resources and other peers.

This paper pursues the improvement of the reusing capabilities of learning object repositories by using web 2.0 functionalities. In order to do so, next section shows how annotation can be used to improve learning resource search and sharing. Third section presents how the approach has been validated by a case study and the last section concludes the paper and presents the further work.

## **2. Using tagging to Improve Institutional repositories**

We propose the use of social bookmarking tools for bridging the gap between learning resources stored in the digital repository and the final users of such resources, namely teachers and, especially, learners. This bridge is bidirectional, so both repository managers and final users can take advantage of the activity performed with the resource in the repository. Our idea is allowing final users to take any resources they find interesting with them (actually, a permanent link to the resource), organize it, describe it according to their own criteria and share it among their colleagues. In fact, we want to promote the creation of communities of learning around a given topic or subject but simplifying the management of resources, taking advantage of the basic functionalities provided by the institutional repository. On the other hand, we want to analyze the activity among all the users in the community of learning in order to extract information that will be used to better understand users' needs and improve the services offered by the repository. Users should be also able to propose a new resource to be added to the repository, just by providing a link to such resource and tagging it accordingly.

Every time a new learning resource is ingested into the repository, there are two key elements that allow us to connect it with the network of repository users. First, as aforementioned, the repository should provide a permanent URL for the resource, which will be used to access it. Second, each resource should have a RSS channel which will be used to inform users about all the activity generated around such resource. These are the two only elements needed by final users in order to interact with the resources at a basic level.

Each user should create an account in a social bookmarking site (we use delicious<sup>1</sup> but any other similar service could be used instead) and then adopt a simple policy for content tagging and sharing among a community of learning. For example, a common tag should be used for all the resources related to a given topic or a course. The use of pre-defined tags and tag bundles is also encouraged. Obviously, in addition to the pre-defined tags, each user should also tag resources with other tags she considers useful. The philosophy is to share basic criterion but without losing personalization.

In order to support the user in finding out the pre-defined tags a special user (usually named the “gatekeeper” or the “gardener”) takes care of all the interactions between resources and users, by gathering and analyzing the activity around a given topic (i.e. a course), the ultimate goal of the community of learning. This user, maintained by the institutional repository managers, will become “friend” of all the users in the community of practice, i.e. creating a network, thus establishing a channel for providing feedback to the repository managers about the activity of the community. It is important to clarify that the role of the gatekeeper is not to constraint the tags the users can use, but to propose the best possible tags in order to satisfy a minimal coherence and quality. With that purpose in mind, gatekeeper will analyze the way users tag resources in order to find out the most suitable tags for each resource (see (Sugumarane et al., 2011) and (Minguillón, 2010)) and provide such tags to users. The gatekeeper uses metrics based on tag frequency in order to find out the candidate tags per resource, such as the frequency of tag use and the number of users using a tag. The gatekeeper also uses other statistical measures, such as Principal Component Analysis, in order to estimate the relatedness of tags, that is the similarity, the co-occurrence, and the synonymy among tags.

### **3. Evaluation**

We have tested this scenario during a course on open educational resources that was carried during May 2011 at the Universitat Oberta de Catalunya. The Universitat Oberta de Catalunya is an online university offering all types of courses including higher and postgraduate studies. Currently, more than 40,000 students are enrolled. All subjects at the UOC are led by the lecturer responsible for the subject called PRA, who coordinates a team of teaching staff. The team members carry out the teaching and are known as “Consultants”. They accept responsibilities for guiding the students assigned to virtual classrooms during their learning process, correcting their activities and resolving any queries they might have.

In our test we had two groups around 20 students each (one in Catalan and another in Spanish). The students of the course are teaching staff (Consultants) from the UOC. This course is voluntary, although enrolled students can obtain an accreditation if they finish it.

During the course, the students had to search and share open resources about open educational resources (OERs), thus enlarging an existing collection

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<sup>1</sup> <http://www.delicious.com/>

already created and shared through Delicious<sup>2</sup>. All these resources were tagged using “#metaOER”, so the gatekeeper (in our case “uocunescochair”) can keep track of all the new resources added to the collection through delicious. No further special guidance rather than the basic goal (seek and share OERs) was provided to the students, as we wanted to measure the degree of knowledge and expertise of using social bookmarking of our consultants.

From the 23 students who did not drop out the course during a previous learning activity (defining and discussing about the concept of OER), 15 performed the activity (65.2 %). Surprisingly, even though these students are teaching staff from a virtual university, only 4 of them knew about delicious before doing the proposed activity. This “rookie” profile can explain why the tags they used were so irregular in both number (too few) and typology.

Currently now, some of the resources found out and tagged by students are being adapted and ingested into the UOC institutional repository, with the aim of creating a community of practice on open educational resources<sup>3</sup>. We asked the course participants to select the resources they considered the best ones and tag them, as well as propose new resources for such collection. Another stunning fact we discovered after the course is that most of students were not aware and therefore never used the UOC institutional repository before.

The results of this pilot experience are not very conclusive since most of students of the test were not used to tag and using social bookmarking services. Even though the insights of the test show that the approach is theoretically viable, it seems clear that more work needs to be done in order to make it useful in a real environment such as the UOC. In particular, we cannot take for granted that our students are “2.0” and, therefore, that they know and excel on the use of web 2.0 tools. Even though our students were supposed to have a high technologic-friendly profile, mostly of them (73.3 %) did not know about delicious. That fits with preliminary studies (Minguillón, 2009), where only around 11% of students taking a course on Statistics recognized to be users of delicious.

#### **4. Conclusions and further work**

This work describes an approach to support the creation and management of learning communities using folksonomies within the context of institutional repositories, combining top-down services with bottom-up strategies. The key contribution of this work is the use of crowd knowledge in order to promote homogeneity on the tags users use in a non-intrusive way as well as allowing learners to organize their own resources according to their own criteria but taking advantage of the institutional repository (namely permanent links and RSS channels).

We also measured the level of knowledge of social bookmarking tools such as delicious among teachers participating in a course on OERs. Both delicious and the institutional repository were mostly unknown to them. Therefore, we believe that basic training in web 2.0 tools should be promoted if we plan to use them in teaching/learning activities. We saw that expecting students (even if they are

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<sup>2</sup> <http://www.delicious.com/uocunescochair/#metaoer>

<sup>3</sup> <http://openaccess.uoc.edu/webapps/o2/handle/10609/7022>

teachers/consultants) to throw into the pool by themselves is not realistic. Nevertheless, most of the “rookie” students commented that they adopted (or plan to do it) Delicious at the end of the course since it resulted to be a very useful tool to manage and share resources.

Further work will focus in the evolution of the gardener in order to improve the quality of its proposed tags, as well as analyzing the interactions between the users of large communities of practice (i.e. 4000 students enrolled in Statistics).

## **5. Acknowledgements**

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