

# Information repositories and learning environments: Creating spaces for the promotion of virtual literacy and social responsibility

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*Information repositories are collections of digital information which can be built in several different ways and with different purposes. They can be collaborative and with a soft control of the contents and authority of the documents, as well as directed to the general public (Wikipedia is an example of this). But they can also have a high degree of control and be conceived in order to promote literacy and responsible learning, as well as directed to special groups of users like, for instance, school students. In the new learning environments built upon digital technologies, the need to promote quality information resources that can support formal and informal e-learning emerges as one of the greatest challenges that school libraries have to face. It is now time that school libraries, namely through their regional and national school library networks, start creating their own information repositories, oriented for school pupils and directed to their specific needs of information and learning. The creation of these repositories implies a huge work of collaboration between librarians, school teachers, pupils, families and other social agents that interact within the school community, which is, in itself, a way to promote cooperative learning and social responsibility between all members of such communities. In our presentation, we will discuss the bases and principles that are behind the construction of the proposed information repositories and learning platforms as well as the need for a constant dialogue between technical and content issues.*

## Digital Repositories

There are very different understandings and definitions of information repositories or digital repositories. The main reason for this diversity is the wide variety of contexts, communities, purposes and practices attached with the creation and functioning of those repositories. From worldwide systems, covering all subjects, allowing anyone to input or edit information, to institutional or subject based systems for authorized users only, with approval and quality control procedures.

At the same time, as several communities of practice – libraries, e-learning, information systems, publishing, archives and records management - converge and are active developing digital repositories, it may be useful to explicit the meaning and scope of repositories in this paper. So what do we mean by digital repositories?

In this paper, as stated in the Digital Repositories JISC Briefing Paper (2005), “a digital repository is where digital content, assets, are stored and can be searched and retrieved for later use. A repository supports mechanisms to import, export, identify, store and retrieve digital assets”. But, even this definition is general and can be applied to very different information systems.

Thus it's necessary to clarify which are the features and characteristics of digital repositories that differentiate them from databases, content management systems, and other systems that store digital contents? Four characteristics have been identified as differentiating repositories from other digital collections (Heery & Anderson, 2005, p. 1-2):

- content is deposited in a repository, whether by the content creator, owner or third party
- the repository architecture manages content as well as metadata
- the repository offers a minimum set of basic services e.g. put, get, search, access control
- the repository must be sustainable and trusted, well-supported and well-managed

The focus and motivation for establishing digital repositories may also differ, according to the context and the communities where they are built, and consequently there is also some variation on the services they provide to those communities, ranging over several functional areas, like enhanced access to resources, new modes of publication, data sharing (re-use of learning objects, re-use of research data) an preservation (Heery & Anderson, 2005, p. 6).

From the overall set of systems called repositories, institutional repositories are the most numerous and important subset. According to one of the most cited definitions, institutional repositories are “a set of services that a university offers to the members of its community for the management and dissemination of digital materials created by the institution and its community members” (Lynch, 2003).

Institutional repositories have emerged on the university context, and related with the issue of Open Access to scientific literature (SPARC, 2002). Self-archiving peer-reviewed journal articles in institutional repositories is one of the two strategies to Open Access (as defined in the Budapest Open Access Initiative - <http://www.soros.org/openaccess/> - the other being Open Access Journals) and the most effective and fast road to achieve it (Harnad, 2005).

But despite this origin, institutional repositories are being used to archive, disseminate and preserve other types of documents and contents than research papers and articles, and institutional repositories are being built outside the university or research environment. In this sense, building on Lynch (2003) definition, the MIRACLE Project - Making

Institutional Repositories in A Collaborative Learning Environment - defined institutional repositories, in the educational setting institutional, as “a set of services that an educational institution offers the members of its learning community for the management and dissemination of the digital materials created by its members. The organizational commitment to the stewardship of these digital materials usually includes providing long-term preservation, organization, access, and distribution services” (MIRACLE, 2006).

Recently, there is a rising interest about repositories on teaching and learning contexts, and a growing number of learning resources or learning objects repositories are being developed and made available. One of the reasons for the augmenting number of repositories is the increased availability of software platforms to host and develop repositories.

In fact, besides commercial platforms for general repositories (like Digital Commons) or commercial specialized platforms for Learning Objects Repositories (like Blackboard Content System, Desire2Learn or The Learning Edge) there are several Open Source software platforms available.

It is worth noting that, contrary to what happens with the majority of commercial platforms, most of those Open Source repository platforms implement a protocol that improve the visibility and “openness” of the contents they host and enables the interoperability between repositories and whit other information systems: the OAI-PMH, Open Archives Initiative Protocol for Metadata Harvesting (2002).

It is not on the scope of this paper to compare features and functionality of the different platforms for repositories, and there are some good comparative studies available (Open Society Institute, 2004; CPIT, 2006). We will just briefly mention three of the most currently used repository platforms: DSpace, Eprints and Fedora.

DSpace - [www.dspace.org](http://www.dspace.org) – is a digital repository system, jointly developed by MIT Libraries and Hewlett-Packard (HP). DSpace is freely available as an open source system that can be customized and extended to capture, store, index, preserve and redistribute documents in digital formats. The DSpace community of users manages the code base and releases new versions of the software. Leading the DSpace Community's development work are a group of dedicated developers and users called e Committers. Currently there are more than 200 DSpace installations worldwide, mainly supporting institutional repositories in university, but also learning object repositories, eTheses repositories and other type of digital archiving systems.

Eprints - [www.eprints.org/](http://www.eprints.org/)- was created and is still being developed by the School of Electronics and Computer Science of University of Southampton, UK. Eprints is freely available as open source software and is described as the easiest and fastest way to set up repositories of open access research literature, scientific data, theses, reports and multimedia. Being narrowly focused on open access to research literature, Eprints is the most used platform for institutional repositories, but there are few significant repositories of other kind of materials (learning materials,etc.).

Finally, Fedora - [www.fedora.info/](http://www.fedora.info/) - is a general purpose repository system developed jointly by Cornell University Information Science and the University of Virginia Library. Fedora aims to provide an open source repository software and related services to serve as the foundation for many types of information management systems. Probably the system with greater architectural flexibility to support different types of repositories and contents, Fedora

is presently the less used of the three systems, probably because it is the most knowledge and time demanding in the installation, configuration and customisation phases.

Using open standards and protocols that contribute to the communication, interoperability and integration between different systems, these open source software systems are probably able to reply to the demands of the repositories of the future that “ will be much more interoperable with systems used to support learning and teaching, Virtual/Managed/Personal Learning Environments, assessment systems, ePortfolios, etc., as well as with authoring tools, other repositories, portals and library systems” (Heery & Powell, 2006, p. 8) .

## **Digital Repositories and learning environments**

The use of repositories in learning environments is being growing in the last years, but the growth rate of those repositories and the uptake of those systems by the communities they intend to serve is not meeting early expectations of a quick and generalized success.

Integrated in Institutional Repositories archiving different type of documents and materials, or standing alone as individualized information systems, those repositories, often called Learning Object Repositories (LORs) aim to support practices of sharing and reuse of resources for teaching and learning.

Defined as “digital store boxes that host collections of digital resources in a learning object format: i.e. resources that are designed to be integrated, aggregated, and sequenced in an efficient way to produce “units of learning” that are meaningful to learners” (Margaryan, Milligan & Douglas, 2007, p. 3) LORs can be set up at institutional, regional, national, or international level.

Some of the reasons for the slow adoption of repositories in learning environments may be found on the technical difficulties and barriers, the lack of ICT skills or awareness, that still exist to many potential users and communities. But, as pointed out by Margaryan, Milligan & Douglas (2007, p. 3) the fact that LORs seem to be driven by the exploration of the technology potential, “rather than by learning needs and socio-cultural contexts of the communities which they aim to serve” is certainly one of the major explanations.

Doing so, ignoring social and organizational dimensions on the design, as Dobson, LeBlanc & Burgoyne (2004, p.2) emphasize, often results in “...poor matches with users’ needs, misalignment with change policies and plans, confusion of roles and responsibilities in practice, and as a consequence, often very poor levels of technology uptake and use”.

On the contrary, the design of the LORs must be “based on understanding of cultural norms and expectations of their user communities” (Margaryan, Currier, Littlejohn & Nicol, 2006, p. 4).

As noted by several authors (Dalziel, 2005; Margaryan, Currier, Littlejohn & Nicol, 2006) successful repositories, promoting sharing and reuse of learning resources and learning objects, must be focused on community rather than on the repository, must be focused on learning activities and design rather than content, must be driven by the needs of pedagogy, and not (mainly) by power of technology.

Libraries, particularly school libraries, are the natural place to develop useful and successful repositories. Being the space and the service where information resources are collected, organized and made available for the community, being a meeting and sharing point playing an important role as a community place in the school, having skilled staff, a culture and ethos of quality and service, school libraries can reply efficiently to this challenge.

### **Building digital repositories in the school library context**

As stated by Loertscher (2002), the “school library would be every student’s and teacher’s essential information system. To these users, it all begins at the school library, since it is the gateway to the world. It is the place to start: a safe and nurturing information environment”.

In the new information environment, to remain the essential information system and the gateway to the world, the school library needs not only to reply to the changes in the learning and teaching practices, and in the information landscape, but also to proactively anticipate those changes.

Discussing the challenges that libraries have to address in the digital landscape, Lorcan Dempsey, OCLC’s Chief Strategist, predicts that in the medium term “the library will need to engage with major shifts in research and learning practice. In the short term, the library needs to begin building services around user workflows, supporting the remix of content and services in user environments, and developing digital curation services” (Dempsey, 2006).

In this sense, the creation of digital repositories is a decisive task to accomplish its missions within the new informational society, according to the following functions assigned to all school libraries:

- identification, selection and evaluation of the information resources that can be found in different environments;
- organization and distribution of such resources, within traditional and digital environments, according to its characteristics;
- articulation of the curricula with the information services and facilities;
- coordination and training in research strategies, according mainly to the new information environments (i.e., Internet) and the research processes most used by the pupils

In the context of the school library, digital repositories should be associated to the distribution of quality information and support of scientific contents. This means that these repositories require a shared management of the collections, allowing a collaborative work with public libraries and other school libraries, but also with individual agents, such as teachers and librarians, and also taking a particular attention to the special interests, needs and use of information by the students. To attend their needs and help them being autonomous in research, the construction of quality digital repositories, conceived as literacy environments, is a task that school libraries should assume as one of their most important missions in the present time.

Eventually, the creation of digital repositories leads to a different organizational environment, where the need to create reference groups for the identification, evaluation and

selection of information resources results in a new understanding and use of the school library by the school community, considered as a whole.

In fact, the construction and development of digital repositories can, at the same time, accommodate and promote important changes within the learning environment, where the library is a decisive factor of cooperation, leading the implementation of new work and study methods and a new form of relationship between the teacher librarians and the school teachers – the teacher becomes more of a researcher and a mentor of the research based learning, and the librarian assumes a training role regarding research strategies, evaluation and organization of information.

At the same time, digital repositories can help to lead, in a qualitative way, the inevitable change of the text book culture and traditional literacies to the new emerging informational world, that imply new ways of studying, learning and even reading.

Building digital repositories of learning and teaching resources within the school library context, and making them openly available for the school community can have a powerful effect on students and teachers, promoting sharing and re-use of learning objects and materials, helping disseminating good practices, raising self-awareness and quality standards on teacher materials and student works.

Digital repositories, used for delivery, evaluation and archiving of student work, as well as teacher contents, can also help meet student's experiences with Web 2.0 collaborative tools and environments, and the expectations of similar collaborative environments at school. In fact, as argued by Richardson (2006), "In an environment where it's easy to publish to the globe, it feels more and more hollow to ask students to 'hand in' their homework to an audience of one. When we're faced with a flattening world where collaboration is becoming the norm, forcing students to work alone seems to miss the point. And when many of our students are already building networks far beyond our classroom walls, forming communities around their passions and their talents, it's not hard to understand why rows of desks and time-constrained schedules and standardized tests are feeling more and more limiting and ineffective."

### **Concluding remark**

It is now time that school libraries start creating digital repositories, oriented for the whole school community and directed to their specific needs related with information, teaching and learning.

As the creation and maintenance of those repositories will demand the skills of teachers, librarians, computer systems administrators and an important amount of work time, it will difficult that they can be established on an isolated manner at the school level. But the creation of school repositories in a cooperative way, namely through regional or national school library networks, is a possible and viable solution.

The creation of those repositories implies a important work of collaboration between librarians, school teachers, pupils, families and other social agents that interact within the school community, which is, in itself, a way to promote cooperative learning and social responsibility between all members of such communities.

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### *Authors Notes*

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