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Creating activities from adaptive learning objects

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Abstract

Open Educational Resources (OERs) can be defined as Learning Objects (LOs) that are easily created and stored in repositories to be freely shared, used and reused by teachers and students. While all of these features add value to OERs, there is one aspect in which OERs fail to meet the standards expected by recent practices in e-learning, and that is their difficulty in offering a reasonable level of adaptability. This is the problem addressed in this paper. The solution proposed is a division of learning objects into modules and activities. Modules are smaller, mouldable components build by the teacher and for the teacher. They can be shared, used, reused, and, mainly, adapted by the teacher to meet specific needs. Activities are larger blocks mounted by the teacher from one or more modules to be used by the student. Every time a teacher mounts an activity he or she can create, incorporate and/or adapt previous modules, prepared by him/herself or by other teachers. A specific computer program, built on Open Source Software, was created to test the proposed system. Further testing with both teachers and students has produced favourable results. Using observation, questionnaires, and interviews, we found that teachers preferred the proposed system to other authoring systems they had used before. Students, on the other hand, showed that they enjoyed being assisted in their performance by the automatic feedback provided by the learning objects prepared by the teachers.

Keywords: Learning Objects; Open Educational Resources; Authoring Systems; Reusability

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1. Introduction

Open Educational Resources (OERs) can be approached from a technological or a dialectical perspective (Devan & Tullio, 2008; Neil, 2011), both associated with the idea that things change. In the area of CALL, in spite of its traditional link with technology, the association has been closer with dialectics, in the sense of getting it out in the open (Attwood, 2009), as we can see in the following definitions of Learning Objects (LOs), presented at the beginning of the century, and the more recent definition of OERs:

Learning Objects:

[D]igital resource that can be reused to support learning...[including] small bits of text, animations, and smaller web-delivered applications...[and] larger reusable digital resources... such as a complete instructional event.

(Wiley, 2000, p. 7)

Open Educational Resources:

[R]esources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge.

(Atkins et al, 2007)

Both LOs and OERs are defined as resources, both include large and small objects, and both assume the same technology; the only difference is the dialectical orientation of OERs, made clear in the first sentence with the instruction that the resources should reside “in the public domain”, allowing for “free use”. What may have emerged as a commodity in a capitalist market (LOs) is now explicitly defined as public domain (OERs).

My contention is that the technological aspect should be reconsidered, not in detriment of the dialectic orientation, but on the contrary, as a way of improving it. LOs are typically monolithic chunks assembled with other monolithic chunks to produce larger units of learning. Technology can make the chunks adaptive, restructuring them internally to produce customized teaching units, grounded on the atom metaphor as proposed by Wiley (1999), but going beyond it. I believe this approach to LOs has a better chance of affording collaboration between students, between teachers and between teachers and students. This will be demonstrate briefly in the following section, summarizing the authoring system developed in my research project and the reactions produced by teachers when preparing the objects and by students when using them in the classroom. Although I use both OERs and LOs, they are not used interchangeably; OERs are in seen more like LOs plus dialectics.

2. Dividing to conquer

Defining LOs on a granularity scale that moves from something as small as a “bit of text” to something as large as an “instructional event” is problematic in two ways: (1) it conflicts with the idea that LOs are chunks to be assembled (Koohang, 2004) and (2) it rejects the notion that LOs do not incorporate an instructional design (Cheal & Rajagopalan, 2007). It is very difficult to treat a large object such as an “instructional event” either as a chunk to be assembled or to deprive it of its instructional element. The solution advanced here for these two problems is to divide LOs into two components: modules and activities. Modules are smaller unassembled objects designed by the teachers and for the teachers, to be refined and combined with other modules. Activities are assemblages of modules made for the students. An authoring system, called Electronic Learning Organizer (ELO, 2013), was built on Open Source Software (PHP) to manage both modules and activities, virtually separated into two repositories: the module repository, accessed by the teacher, and the activity repository, accessed by the students.

When mounting an activity, the teacher can start from scratch, producing new modules or use and adapt modules available in the module repository; every time a module is incorporated into a new activity a copy of the module is created, leaving the previous one intact. The possibility of sharing the modules with other teachers reduces the burden of producing activities for the students.

ELO has been tested by teachers and students on an experimental basis. Teachers enjoyed creating the materials and hearing compliments from their students, sometimes to the point of getting addicted to the system. The students themselves felt valued by their teachers, who spent time preparing activities tailored to their interests. In terms of language learning, students who had difficulty in reading were the ones who benefited the most, diminishing the distance that divided them from the good readers.

3. Conclusions

The unexpected finding in my research using adaptive LOs was the difference in post-test performance between poor student and good students. For the bright students it made no difference whether or not they used LOs, probably because they had little to improve from their entrance level. The progress demonstrated by the poor students in EFL reading comprehension tasks, however, was impressive, sometimes to the point of equaling the performance of the best students. The positive attitude demonstrated by teachers and students, their enjoyment in preparing and doing the activities and their solidarity in sharing their productions suggest that a focus on technology can provide the necessary affordance for citizenship. The interoperability principle brought by the authoring system, allowing for students and teachers to bring their own devices, expands collaboration and facilitates implementation of the four 'R's of OERs: Reuse, Redistribute, Revise, Remix (Hilton et al, 2010). The point of view expressed by Hodgins (2002, p. 76) that LOs are "destined to change the shape and form of learning, ushering in unprecedented efficiency of content design, development, and delivery" probably sounds exaggerated, but if LOs are treated as adaptive OERs, the chances are greater.

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