Chapter 2

Tools Interoperability for Learning Management Systems

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ABSTRACT

E-learning has experienced an extraordinary growth over the last years. We have reached a point in time when most learning institutions have adopted an LMS as an integral element of their teaching and learning infrastructure. In parallel, the number of educational tools available for learning is increasing and keeps evolving. This variety means that it is not always easy or possible to add these educational tools into LMSs to enhance the learning process. It would, however, be in everyone’s interest for these tools to interact with the LMSs. To solve the problem of interoperability between LMS and learning tools, several interoperability standards define ways so that LMSs can interface with external learning tools in order to make them accessible from within the learning platform in an intuitive and concise way. This chapter is focused on the service-oriented approach to interoperability and specifically on the IMS LTI standard and the TSUGI hosting environment that aims to simplify the integration of external learning tools.

1. INTRODUCTION

Innovation on ICT-based learning depends on the ability of the content creators and providers to develop new tools and services and making them available to the general public. The broad adoption of ICT in the education process, means that educators are increasingly on the lookout for new content and methods to adopt into their teaching process or, in some cases, they even go as far as to adapt their entire process to these contents.

This abundance of learning content is a product of social constructivism and social constructionism (Berger and Luckman, 1991), where with the help of technology, learners have transformed from simple consumers of learning contents to producers and creators of contents that they make available to the world for consumption. Social constructionism refers to the knowledge artifacts created by learners through social interaction, while social constructivism refers to an individual’s learning that is attributed to their participation within such a social group.

Formal ICT-based learning, however, usually takes place within a virtual learning environment (VLE) or learning management system (LMS). Usually, once an LMS is installed and integrated into the workflow of an organization, it is very difficult to convince any governance team to replace it with a new one, because of costs in software integration, data migrations, user training and the inherent risks of any software migration procedure. So we can assume that the current install base of the various LMSs is going to be very stable, and changes will mostly come from new organizations or new kind of activities (like the use of new platforms as support for MOOCS). The variety of existing VLEs, means that the availability of learning contents within each platform depends on the author’s or a third party’s ability and willingness to provide a compatible implementation. This inevitably leads to fragmentation of the content availability among the available platforms since creators usually only develop on the platform they themselves use.

On top of that, contrary to the relative stability of the VLEs/LMSs, the teaching tools offered to the educators tend to suffer a lot of changes. These tools keep evolving and new ones are constantly introduced and it is only normal that teachers will want to incorporate them in their teaching. Usually VLEs offer software development kits that allow the creation of extensions - learning activities, visual styles, widgets, even complete virtual classroom frameworks. But these extensions are created, bound and tested for a version of the VLE/LMS and need to be revised and re-tested for each new version. Due to all these compatibility concerns, many big installations avoid installing unofficial extensions (even the ones developed within the organization), and teachers and students have to deal with a stock version of the VLE/LMS.
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