

# Chapter 3.7

## Interoperability

### Approach in E-Learning

### Standardization Processes

**Carmen Bao**

*La Rioja University, (UR), Spain*

**José María Castresana**

*Basque Country University (UPV/EHU), Spain*

#### ABSTRACT

*Providing interoperability by using standards and specifications for E-learning resources is an important element of the virtual learning environments (VLEs). In this context, a large number of international organizations develop specifications that provide principles for reaching a common “language” to be used in exchanging resources among the virtual university. In this paper we turn your attention to an approach and reference for providing interoperability in different standards. The establishment of E-learning standards has promised to improve interoperability between E-learning systems, but can only be done through enforcement of these standards. Many existing E-learning systems are built on top of relational databases, and it is possible a framework which matches XML Schemas (from learning standards) and relational schemas semi-automatically. This type of framework can provide translation between learning objects and relational databases as well as an interface to manually refine existing schema mappings. The focus is E-learning standardization and synchronization in the international and national levels. The work presents a brief updated review and it presents some new challenges, concerning the E-learning standardization processes. This research is in the area of E-learning standardization and issue is one aspect of great interest for all organizations, authorities and experts working in the field of education. Moreover, the most recognized approaches are introduced in order to improve and optimize the management of the E-learning processes. While the establishment of E-learning standards has promised to improve interoperability between E-learning systems, and obviously, this can only be done through*

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*enforcement of E-learning standards and E-learning standardization processes. The aim of this work is to discover the useful E-learning technologies as technological tools for teaching. Therefore, teachers must keep in mind clearly that they must optimize teaching by means of them, such as an improvement of quality education for current society in terms of competences, as connections with the current reality that students spent long hours using them. It starts with a brief background to worldwide standardization activities in the field of educational technologies as means of enhancing the accessibility, interoperability, durability, reusability and efficiency of E-learning resources, but more important new demands and problems to be tackled are reviewed. Finally, experimental dates from studies have shown that it is useful a framework that also provides translation between learning objects and relational databases, as well as an interface to manually refine existing schema mappings.*

## **INTRODUCTION**

The advent of the Internet has reshaped ‘Computer-Based Learning’ permit that a widely available learning resources and commercial learning systems are now easily accessible with an Internet connection. The recent evolution of electronic learning (E-learning) systems has been greatly influenced by the emergence of various learning standards.

E-learning standards today influence various aspects of the E-learning process ranging from content packaging to integration with enterprise systems. Currently, most of the learning specifications are represented in XML format. The widespread availability of related tools and its self-describing nature have encouraged the use of XML in interoperation between information systems.

The development of courseware is an extremely time-consuming process. Hence, users want assurances that such courseware is ‘exportable’ to other platforms when they change or upgrade their learning systems. They expect interoperability through standards-compliance in the E-learning systems they adopt. In this work, a possible framework, which helps to reconcile different data models, by E-learning systems and learning standards and standardization process, has been analyses proposed.

## **BACKGROUND**

### **Ongoing E-Learning Developments**

Over the past few years, numerous organizations such as IMS Global (Instruction Management System-[www.imsglobal.org/](http://www.imsglobal.org/)) have been working on various aspects of E-learning standards, ranging from metadata to accessibility. More details of the current developments in E-learning standards can be found into the related literature. Today, many E-learning systems have been eagerly adopting the standards available. However, the compliance is often applicable to a certain version of the standard. Conformance to standards by E-learning software is, often, incomplete. It is strongly required to enforce these standards via implementation. First of all, we must provide support for managing standards-based XML data.

### **Database Support for XML-Based E-Learning Standards**

While we cannot totally predict the future of storage management in enterprise information and learning systems, the current trend still points to one dominated by relational databases.

Other alternatives that could manage XML data include Object-Oriented Databases (OODBs) and Native XML Databases (NXDs). While Object-Oriented Databases (OODBs) technology

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