Chapter 3

Learning Object Model and Framework Design for the Digital Modules Production

Alicia García Holgado
University of Salamanca, Spain

Francisco J. García-Peñalvo
University of Salamanca, Spain

Valentina Zanrando
University of Salamanca, Spain

Antonio M. Seoane Pardo
University of Salamanca, Spain

ABSTRACT
The MIH (Multicultural Interdisciplinary Handbook) project provides new tools for helping teachers and pupils plunge deeper into the culture and the language of another nation via its history and its landscape/geography. The Digital Modules are the most innovative tool of the project. Throughout the chapter, the authors present all stages to develop MIH Digital Modules: (1) the definition of the Learning Object Model based on IEEE LOM; (2) the framework design in order to provide quality digital contents; (3) the Digital Modules production process both during the project and after the end of the project; (4) the tutorials that support all the creation process; and last, but not least, and (5) the multicultural perspective of the Digital Modules.

INTRODUCTION
The aim of MIH project (Multicultural Interdisciplinary Handbook: Tools for Learning History and Geography in a Multicultural Perspective, funded with support from the European Commission Lifelong Learning Programme) is to build and sharing a set of tools that includes a handbook for teachers, digital modules, and a teacher training course in order to offer a structured path through European contemporary history and geography. Digital modules design and development are the most innovative outcomes of the project both from a methodological and didactical point of views and from the technological solution adopted.
On the website (http://mihproject.eu/dissemination/digital-modules/), a visitor can find 40 completed Digital Modules (DM) in their original language version and 37 that include an English version. They are available as Web-based contents (HTML) and standard-packages learning objects (SCORM – IMS) in order to use them in any Learning Management System (LMS) or Virtual Learning Environment (VLE) that fulfills the above-mention specification. Therefore, in the context of a subject or course, also for an open and free access, the DMs are available for consultation online at the project’s website and for downloading in the GRIAL Group repository (http://http://grialdspace.usal.es:443/handle/grial/118/). These educational contents represent an important contribution to the development of digital educational content. Six multilanguage and multimedia tutorials help teachers use the digital modules and prepare their own DM.

In this chapter, we talk about MIH digitals modules’ production process, from the definition of the Learning Object (LO) model to the creation of new digital modules.

**LEARNING OBJECT MODEL**

In order to develop the MIH Digital Modules, we have proposed a LO model based on the IEEE LOM (2002) with different granularity characteristic for the LO. This way, we have achieved a multilayer LO that will support the multicultural aspects of the digital contents.

There are different definitions of this concept (IEEE LOM, 2002; Polsani, 2003; Wiley, 2000; Moreno & Bailly-Baillère, 2002). In this LO model, we have worked with the definition given by Morales et al. (2007) in order to build LO of greater granularity, following the IEEE LOM standard. This way, a LO is defined as “a unit with a learning objective, together with digital and independent capabilities containing one or a few related ideas and accessible through metadata to be reused in different contexts and platforms.”

The Reusable Learning (2004) website, sponsored by the U.S. National Science Foundation (NSF), defined granularity as “the size, decomposability, and the extent to which a resource is intended to be used as part of a larger resource.” (Reusable Learning, 2004). IEEE LOM standard presents four aggregations levels in order to describe the granularity of a LO (1 being the smallest level of aggregation and 4 the largest level of granularity).

In this context, Morales et al.’s definition suggests a LO with an aggregation level 2 according to the IEEE LOM standard (this means a collection of level 1 learning objects, each of them with one or more level 1 learning objects).

Figure 1 shows the MIH learning object model proposal. In this model, the digital modules are LO that represent a unit of a topic discussed from different cultural point of views. This means that these LO are an aggregation of a set of more basic LO that represents a unit with only one didactic goal that will be developed from a specific cultural orientation. These LO are the aggregation of a set of elementary resources that will be packaged into LO without any didactic goal.

According to this, the simpler LO, without didactic charge, have an aggregation level 1, and they represent the basic resources, such as a table, a text, an animation, an audio, or a video.

The next level, LO with only one didactic goal, introduces the multiculturality support in our model because it is possible to have the same topic presented from different cultural perspectives, each one in a different LO. This means an aggregation level 2 in the LO definition.

The more complex level, with an aggregation level 3, represents the joint of several LO regarding a specific topic that introduces multiculturalism in a European dimension. These LO will be the Digital Modules that will be used in the real classes.
Related Content

Present or Play: The Effect of Serious Gaming on Demonstrated Behaviour
[www.igi-global.com/article/present-or-play/128267?camid=4v1a](www.igi-global.com/article/present-or-play/128267?camid=4v1a)

An International Study on Learning and Process Choices in the Global Game Jam
[www.igi-global.com/article/an-international-study-on-learning-and-process-choices-in-the-global-game-jam/96977?camid=4v1a](www.igi-global.com/article/an-international-study-on-learning-and-process-choices-in-the-global-game-jam/96977?camid=4v1a)

Navigational Paths and Didactical Patterns
[www.igi-global.com/chapter/navigational-paths-didactical-patterns/51523?camid=4v1a](www.igi-global.com/chapter/navigational-paths-didactical-patterns/51523?camid=4v1a)

The Case for the Community of Inquiry (CoI) Influencing Student Retention
[www.igi-global.com/chapter/case-community-inquiry-coi-influencing/69559?camid=4v1a](www.igi-global.com/chapter/case-community-inquiry-coi-influencing/69559?camid=4v1a)