

Quality Learning Objective in Instructional Design



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INTRODUCTION

Due to continuous technological advancements, the Web offers diverse applications for e-learning. However, in practice, many times technological development is considered synonymous with improved education. It is very important to take into account the appropriate use of Web development in order to promote knowledge acquisition with a proper selection, delivery and construction of information.

In order to support knowledge management in e-learning, it is critical to take into account the type of information in development. The evolution of the Web towards semantics supports the idea of giving more significance to contents than to syntax. In this way, the machines can make complex tasks to deliver users the information to meet their needs.

The challenge of defining the type of information to manage for e-learning is a topic that has led to the emergence of new concepts for resource development. One of these concepts is the learning object, which considers resources as independent units that can be re-used for other contexts and educational situations.

However, there are a lot of LOs definitions; the most widespread one is from IEEE LOM (2002) that states the “digital or non-digital entity that may be used, reused or referenced while the learning receives technical support.” However, this concept is too broad to guarantee an efficient resources management. We believe LOs should represent at least a single instructional objective and all of the related materials required to support that goal.

In order to manage LOs without interoperability problems, specifications and standards are in development. However, the ability to interchange learning

objects is not synonymous of a good quality result. Research about quality LOs is a topic that has had limited focus and there are only a few published works dealing with their quality design.

In today's world, reusable LOs concepts and standards for their treatment represent an advantage for knowledge management systems to whatever kind of business that supports an online system. Users are able to manage and reuse content according to their needs without interoperability problems. The possibility of importing LOs for e-learning aims to increase their information repository, but the learning object quality is not guaranteed.

As stated before, the purpose of this article is to provide an awareness of the elements that should be considered in quality learning objects' instructional design for e-learning systems.

According to this, in the second section we propose our own LOs definition considering different kind of aggregation levels; in this way it is possible to make clear what we understand for LOs and what kind of LOs we are managing. Another important issue is to make clear what is the meaning of quality; for this reason in this section we present our own definition about it.

In order to achieve quality LOs design it is important to take into account their characteristics. The third section defines LOs' characteristics in order to promote quality LOs instructional design.

To achieve this we analyze cognitive theories to promote learning as well as explain issues relating to the LOs characteristics that help to improve their quality for a suitable management. It is because LOs need to be enabled with other ones to build the largest units (didactic units, courses, etc.) possible to deliver selected LOs for students; it means they are part of the

whole. In addition, this work offers recommendations for quality criteria of resources to consider in composing quality didactic units from LOs. Finally, the fourth section points out our conclusions

LOS AND QUALITY CONCEPT

There are new organization models, which need to be encouraged (Cunha et al., 2006). One of the most important is the virtual organization model (Putnik et al., 2006). As a product of Web development, the LOs concept exists (Moreno & Bailly Baillièrre, 2002; IEEE LOM, 2002; Polsani, 2003; Wiley, 2000). LOs have characteristics of being independent units, which are able to be reused in other educational situations.

In agreement with this there are new ways for working and organizational dimensions (Cortés et al., 2006). Knowledge management for e-learning based on reusable LOs means the possibility of accessing specific content according to the learners' needs. To avoid interoperability problems, there are some organizations that are working to develop standards and specifications to manage resources for e-learning systems.

To manage LOs, it is important to respond with what we understand for LOs. We define a LO as a "unit with a learning objective, together with digital and independent capabilities, accessible through metadata to be reused in different contexts and platforms" (Morales et al., 2006).

LOs must have a learning objective because it enables it to direct the contents and material relating to them. Ideally a LO must contain different types of elements, which help to clarify the main idea. In this way learning could be reinforced.

For reusing LOs in many educational levels and contexts, it must include a principal or a few related ideas; in this way teachers are free to decide in which learning context they must be used. It is possible because LOs are not necessarily related to any time, methodology or instructional design.

Independent LOs characterized by one or few related ideas means the possibility to teach some topic by itself, avoiding reusability problems. Accessible through metadata capabilities deliver the LOs characteristics providing different kinds of information about them.

Our proposal is based on IMS specifications, for this reason we refer to metadata considering IMS LOM

(Learning Object Metadata) (IMS LOM, 2003), which is a derivation of IEEE LOM (IEEE LOM, 2002). Finally, LOs reusability means the possibility that a LO could be reused many times independent of software and platforms changes. This issue reflects their interoperability and durability characteristics.

IEEE LOM (2002) defines different kinds of aggregation or granularity levels for Los; this means different type of LOs to manage according to their size. However, we think IEEE LOM (2002) definitions are too wide and do not consider educational sense. According to this we suggest the following definitions:

- **Level 1:** The smallest level of aggregation, for example, a picture, an image, a text, and so forth (IEEE LOM, 2002)
- **Level 2:** A lesson with a specific learning objective and a kind of content, practice and evaluation activities
- **Level 3:** A learning module composed by a group of lessons (LOs Level 2), practice and evaluation activities
- **Level 4:** One or more courses composed by a group of modules (LOs Level 3) with different kinds of contents, practice and evaluation activities

The levels mentioned suggest pedagogical components in order to help students to achieve their learning objectives. However this issue is not enough to ensure quality Los.

In order to propose quality LOs design it is important to define what is the meaning of "quality Los." According to the RAE (2006) definition, quality is a property or group of properties inherent in a thing, which aims to judge their value. Taking into account this definition and LOs characteristics, we define quality learning objects design as a property or group of properties inherent in a learning objects, which aim to value them as equal, better or worse than other ones.

Quality is a concept that involves other issues for their evaluation, for example, quality criteria, metrics, instruments, and so forth. To achieve a whole quality LOs design, in the next section we are going to mention LOs characteristics that aim to define quality criteria to evaluate their quality for an instructional design process.

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