

Shareable Learning Objects

Tina Stavredes

Capella University, USA

INTRODUCTION

As we look to the future, we are poised at the edge of an ever-expanding universe of opportunities to learn. The Internet has opened the door for access to a vast amount of knowledge available to different users in different locations at the same time. The educational landscape is also changing to expand opportunities to learn at any time and any place through distance education. Additionally, Internet access is opening doors for a new population of learners who previously could not continue their education due to location, work, and time constraints. However, without new instructional design processes and standards, the time and effort it takes to utilize disparate resources for learning inhibits the ability to utilize the resources available.

In this article, shareable learning objects will be presented as a way for sharing information in standard ways that will allow the design of learning events that fit the needs of learners and provide just-in-time opportunities to develop skills and knowledge.

DEFINITIONS

Many definitions of learning objects exist, forming a definition continuum from any digital or non-digital entity used during technology support learning to only digital entities that are delivered to support learning (Wiley, 2000). According to Gibbons, Nelson, and Richards (2000), instructional objects refer to any element that can be independently drawn into a momentary assembly in order to create an instructional event. In this definition a learning object can exist in any form, digital or non-digital. In *Connecting Learning Objects to Instructional Design Theory: A Definition, a Metaphor, and a Taxonomy*, Wiley refers to the definition from the Learning Technology Standards Committee that supports the definition of a learning object as being digital or non-digital. Wiley writes:

"The Learning Technology Standards Committee chose the term 'learning objects' (possibly from Wayne Hodgins' 1994 use of the term in the title of the CedMA working group called 'Learning Architectures, APIs, and Learning Objects') to describe these small instructional components, established a working group, and provided a working definition: Learning objects are defined here as any entity, digital or non-digital, which can be used, re-used, or referenced during technology-supported learning." (p. 4)

This definition upon examination was too broad and failed to exclude anything including a person, place, thing, or idea referenced during technology-supported learning. Wiley summarizes different definitions of a learning object and then settles on the following definition: "any digital resource that can be reused to support learning" (Wiley, 2000, p.7). He chose this definition to include anything, big or small, delivered across the Internet on demand, including digital images, video, audio, animations as examples of small objects, and larger reusable digital resources such as Web pages that combine text and multimedia or any large instructional event such as a unit, module, or course. The important difference is that in this definition, all learning objects are digital, which provides greater opportunities for reusability and interoperability in different learning systems. For the purpose of this article, the Wiley definition of a learning object as "any digital resource that can be reused to support learning" (Wiley, 2000, p. 7) will be used.

Despite the disparate definitions of a learning object, there is little argument that credit can be given to Wayne Hodgins for coining the term "learning object" in 1992 (Jacobsen, 2002). It is important to note, however, that David Merrill's instructional design theory, Component Display Theory (CDT), is one of the earliest expressions of objects as components of instruction. CDT uses the term "knowledge object" when referring to a unit of instruction (Merrill, 2000).

As stated above, the importance of defining a learning object as a digital entity is in the ability to obtain maximum reusability and interoperability with different environments. For this to occur learning objects need to be in a digital format that allows for the simultaneous use of resources in more than one place or context. Reusability of learning objects also presents opportunities for improving the cost effectiveness of developing learning events. Instructional designers can use learning objects as a single discrete learning event covering a single objective or as a building block to create larger units, modules, or courses. The learning object building blocks can be disassembled and reassembled to create new learning events, thus providing the opportunity to build economies of scale for the development process.

Granularity

Important to the discussion of learning objects is the issue of the size of learning objects and the language used to describe size. “Granularity” refers to the size of a learning object, although currently there are no standards to measure size. When referring to granularity, it is helpful to imagine grains of sand. The finer the granularity of the sand, the smaller the individual sand crystals are. For learning objects, the same analogy can be used, thus the smaller or more fine-grained a learning object is, the smaller it is. Defining the level of granularity of a learning object is an important consideration during development. Smaller learning objects allow for more flexibility in usage; however, there is increased time required to build a meaningful unit of learning from small learning objects. South and Monson (2000) state that course-level granularity (a learning object made up of a complete course) down to concept level (a learning object made up of a single concept) is useful, but they caution against moving to the level of a single media asset such as an image, graphic, or audio file. It is important to note that developing large learning objects at the course level results in limited reusability for a variety of settings. When referring to reusability, a learning object must be context independent, meaning that it does not refer to other learning objects and does not depend on other learning objects for meaning and understanding. A learning object must be able to exist independent of any other object and be relevant in different learning environments for maximum reusability. Wiley elaborates on granularity

by stating that granularity of learning objects can be looked at as a trade-off between the expense of cataloging many small granular learning objects and the possible benefits of reuse (Wiley, 2000).

STANDARDS

In order for learning objects to be reusable and transportable between environments, applications, and delivery systems, they need to meet set standards and be designed in a way that maximizes their ability for reuse. A number of groups have formed to develop standards to maximize reusability, accessibility, and interoperability. Among the groups working on standards are the Aviation Industry CBT Committee (AICC), IMS Global Learning Consortium, Institute of Electrical and Electronics Engineers (IEEE), Advanced Distributed Learning (ADL), and Dublin Core. In 1999, the Advanced Distributed Learning (ADL) group recognized that all of the organizations developing standards lacked a common framework. ADL developed the Shareable Content Object Reference Model (SCORM) by incorporating many of the standards for Web-based learning systems into a single model for sharing content across different learning management systems (Technical Report, 2003). SCORM is specific to learning content that is delivered in a learning management system (LMS), therefore Web content existing outside an LMS as simple linked pages on the Internet are not covered by SCORM. For the purpose of SCORM, an LMS is any system that can launch content, communicate with the content, and store learner information. SCORM is specifically used to standardize how learning content is launched and tracked, and to define its intended behavior and logic so content can be reused, moved, and searched for. You will see learning objects referred to as a reusable learning object (RLO) or a shareable content object (SCO). A learning object that is packaged for delivery in a LMS is referred to as an SCO, which is a standardized form of a learning object that is delivered within a learning management system.

Components of SCORM

SCORM consists of a content aggregation model, a run-time environment specification, and most recently a sequencing and navigation specification.

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