

# Virtual Community of Learning Object Repository

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## INTRODUCTION

In recent years, there has been an increasing demand for innovative ways of delivering education, which led to a more personalized, flexible, and portable learning (Zhang et al., 2004). The use of the Internet to support the needs for learning is commonly referred to as “*e-learning*.”

The origins of e-learning can be traced back to distance education and computer-based training (CBT). Distance education started in the 1800s as correspondence classes for people needing education who were not able to attend or have access to traditional programs. In the mid 20<sup>th</sup> century, telecommunication technologies such as radio, and television were added to mails as delivery methods. As computers became more widespread, computer-based learning (CBT) distributed on digital media, such as CD-ROMs became common (Neal & Miller, 2005). In the 1990s, as computers connected to the Internet became pervasive and innovative Web-based delivery methods were developed, e-learning became a primary method for delivering distance education.

The effectiveness of e-learning has yet to be proved (Downes 2005; Zhang et al., 2004). In previous studies, inadequately organized and equipped e-learning materials and systems can result in frustration, confusion, and reduced learner interest (Hara & Kling, 2000; Maki, Maki, Patterson, & Whittaker, 2000). Simple delivery of learning materials through Web can lack of immediate feedback, social activities, and motivation (Zhang et al., 2004).

These problems can be addressed by using innovative learning contents and systems. Multimedia contents using audio, video, animation, and interactive simulation can help motivate learners. Synchronous/asynchronous communication tools such as e-mail, Internet chatting can shorten response time increase overall learning (Bjedov, 1995). Discussion boards and collaborative learning environment such as MOOSE Crossing foster online community to provide social activity and peer

support for learning (Bruckman, 2002). More recent Web-based communication tools such as blogs and/or wikis are integrated into e-learning platforms (Augar, 2006; Chun, 2004) to provide feedback and let learners share knowledge each other.

Additionally, e-learning has many advantages over traditional classroom learning. Learning process in e-learning is learner-centered and self-paced. Time and location are flexible, so it is easy to reach potential students. Education can be cost-effective for learners and instructors (Tucker, Pigou, & Zaugg, 2002; Zhang et al., 2004). For these reasons, most higher education institutions in the United States provide distance learning programs based on e-learning (Allen & Seaman, 2004). Corporate training and education leverage e-learning to take advantage of its timely delivery, reduced cost, and less travel time (Strother, 2002).

What makes e-learning more flexible and affordable is *learning objects* (LO). As the object in object-oriented paradigm in computer science, an LO is a reusable and self-contained learning content. LOs are flexible and scalable because an LO can be used stand alone, and can be grouped to create an LO of larger granularity (Lee & Su, 2006a). LOs are like LEGO™ blocks that can be assembled together and reused over and over again (Hodgins & Conner, 2000). An LO consists of learning materials with an associated learning objective. The learning material can be content, practice, and/or assessment in the format that can be delivered using the Internet. An LO can include metadata that describes itself. The information in the metadata of an LO can include subject, title, keyword, description, author, date created, audience, language, type of instruction, media type, cost, review rating, usefulness, and so forth (IEEE LTSC, 2005, Lee & Su, 2006a; MERLOT, 2004).

The Web can be used to provide virtual places where people with similar interests get together. A group of people with common interests or goals can form a community on a virtual place to share ideas, information, and experience through the Internet, which is called a *virtual community*. A *learning object repository* is

where LOs and/or their metadata are stored, searched and accessed. A *virtual community of learning object repository (VCLOR)* is a virtual community where the shared goal or purpose of the community members is maintaining a successful learning object repository by creating, providing, evaluating and utilizing learning objects.

In the remaining sections of this chapter, I will first discuss the foundation and architecture of a VCLOR. Current existing VCLORs will be described. Finally, future directions that may change the subject areas, shapes and functions of VCLORs will be addressed. Then a summary will conclude this chapter.

### FOUNDATION OF A VIRTUAL COMMUNITY OF LEARNING OBJECT REPOSITORY

A variety of activities takes place within a VCLOR. In order to facilitate these activities several components are required. The foundation that supports a VCLOR is comprised of LOs, people, and a community Web site.

An LO can include text, audio, an image, a movie, Macromedia Flash, a presentation, or even a Web page or Web site that includes some of those elements. It can also be in the form of a package written in a specific format, such as SCORM (shared content object reference model) (ADL, 2005), WebCT, NETg (Thomson, 2006), LON-CAPA (LON-CAPA, 2004), or CoDESS (Lee & Su, 2006a). LOs and/or their metadata are stored in learning object repositories. Metadata is used to index and classify learning objects for easy recognition and searching/discovery. LOs become searchable and accessible through the learning object repositories.

People in a VCLOR are the registered members of the community Web site. They carry out a variety of activities. The activities include creating, providing, evaluating, and utilizing learning objects; also communicating and interacting with other members, and hosting events in the community. The people can be classified by the roles they play: *content provider*, *content evaluator*, *content learner*, *community manager*, or *community host administrator*. A *content provider* creates LOs, submits them to an e-learning community Web site, and makes them accessible to other members of the VCLOR. A *content evaluator* examines the LOs

submitted for review, assigns them a rating and comments on them in order to provide useful information to content learners. A *content learner* accesses the community Web sites with the intention of using the learning objects for educational purposes. (Some VCLORs allow free access to their learning objects to content learners without requiring membership.) A *community manager* directs the functioning of the community. He or she is responsible for community establishment, membership management, hosting community events, and so forth. A *community host administrator* maintains the community Web site in order to facilitate the activities in a VCLOR. His or her responsibilities include the maintenance of the learning object repository including learning object tools (discussed in following paragraphs), the Web server, the communication tools, and so forth that are necessary to support community activities. It is often the case that a person has more than one role within a VCLOR.

A VCLOR needs a virtual space where its members can get together and where a variety of activities, such as LO submission, LO search, LO review, delivery of learning experience, communication among members and community events, are arranged. A *community Web site* provides this virtual space and is equipped with Web-based system components that support the activities. These components include the *LO repository*, the *LO submission tool*, the *LO search tool*, the *LO delivery system*, and the *LO communication tools*.

The *LO repository* provides storage for LOs and their metadata. LOs are classified within the repository based on their metadata in order to support a learning object search. Depending on the type of learning objects and the architecture of the supporting e-learning infrastructure, an LO repository can be either centralized or distributed. When a VCLOR supports learning objects in the form of Web-accessible resources, its learning object repository is distributed by nature and the community maintains only the metadata repository that functions as a directory of LOs. When packaged learning objects are supported, the LO repository of a virtual community can be centralized, that is the LOs and the LO repository exist within the community Web site, or it can be distributed depending on the repository technology and its configuration.

An *LO submission tool* allows content providers to submit LOs to the VCLOR. It accepts an LO and its metadata as inputs. LOs in specific formats are stored

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