

Learning Objects Design: What do Educators Think about the Quality and Reusability of Learning Objects?

Natasha Boskic

University of British Columbia, natasha@mail.arts.ubc.ca

Abstract

The paper presents the theoretical framework for the research study conducted on faculty assessment of quality and reusability of learning objects. It reviews a) four critical challenges educators face when selecting learning objects: the learner's cognitive process, levels of interaction, evaluation, and instructional design; b) learning object repositories and learning object evaluation; and c) reusability of learning objects.

1. Introduction

This paper presents the theoretical framework for the research study conducted on faculty assessment of quality and reusability of learning objects in the period January-April, 2003.

The purposes of this study were to identify the challenges educators face when designing, developing or selecting learning objects; to present a model of an existing tool for learning object evaluation; and to record educators' perceptions of the instrument reliability, collaborative assessment and learning objects reusability.

2. Theoretical framework for learning objects design

2.1 Challenges that educators face

A review of related literature suggests *four critical challenges*: learner's cognitive process, interaction, evaluation, and instructional design.

Various schools of thought have been developed in relation to students' **cognitive process** - the way knowledge is built. The research applied a theory of constructivism, based on the results of Piaget's [1] and Vygotsky's [2] research. Learners assimilate new information and build it upon their existing knowledge and experience, modifying their understanding in light of new data [3], [4], [5], [6].

Leegan [7] and Moore [8] consider **interaction** the key to effective learning. Moore [8] identifies three different interactions that exist in the education process: learner-instructor, learner-learner, and learner-content interaction.

When talking about the digital environment, Hillman *et al.* [9] adds another type: learner-interface interaction. Those who create knowledge elements or select them for students must be aware of the impacts of those relations to students' motivation and, consequently, their success in the learning process [10].

Knowing how students interact with ideas will help instructors identify how to select and **evaluate** a learning object. Web-based instruction requires the learners' active relationship not only towards the written word, but towards a content that is in constant flux, content that demands more than a passive reading role. When faced with a multimedia element or a learning object that has become a part of the virtual repository, there have not been many tools developed to establish the criteria for the digital resources.

Finally, the instructors' understanding of learners' cognitive process and the importance of interactions in the learning setting, as well as their ability to evaluate a learning object and reuse it in a new customized digital environment leads to better **instructional design**. This includes the selection of instructional materials, activities, and methods of assessment. Good instructional design makes a learner comfortable and more accepting of the content [9].

2.2 Learning objects repositories and learning objects evaluation

To assist educational practitioners in meeting the challenges of finding and selecting learning objects, repositories of learning objects started to emerge in the mid 1990s. Perhaps the most well-known learning objects metadata repository is MERLOT (Multimedia Educational Resource for Learning and Online Teaching) (www.merlot.org) [11]. The problem, however, with the existing repositories is not the availability of the resources, but the quality of the materials in them as Wiley [12], Williams [13], and Nesbit [14] point out.

Most of the repositories of learning objects offers no support for quality evaluation (e.g. Telecampus [15], Apple Learning Interchange [16], MathForum [17], Alexandria/Careo [18]); a few have a space for user comments (e. g. Wisconsin Online Resource Center [19]), but only MERLOT and Harvey Project [20] have peer reviews included.

2.3 Reusability of learning objects

Technical/operational aspect of learning objects reusability deals with the problems of cataloging, retrieving learning objects and creating a system for repository interrelation. Some researchers think that resolving the instructional/pedagogical issues is where real challenges lie. Wiley [21] quotes Reigeluth and Nelson's [22] findings on how every teacher breaks the resource down into its constituent parts first, and then puts them together again in a different arrangement. To avoid the deconstruction/reconstruction process, a learning object should be that elemental constituent component that cannot be broken down any further and is ready for instructional use in different combinations. In respect to the size of LOs, South and Monson [23] suggest moving from the course level to the concept level of granularity, but at the same time cautiously state that, "the optimal level of granularity must be determined for each project based on its individual goals". Breaking down resources inevitably leads to the next question: Who owns what? Some educational practitioners are strong advocates of open-source type of approach, but not all academics agree with this idea of free sharing. The pros and cons were debated at: www.col.org/copyright [24].

Protecting legal rights of the authors may prevent the reusability of some learning objects.

3. Further research

The research focused on the qualitative analysis of the LO evaluation instruments reliability and their acceptance by faculty and other educational workers involved in learning object development, evaluation and/or usage. It demonstrated how the participants perceive this process, with respect to three key points: reliability, collaboration and reusability. This was obtained through surveys with the subjects before and after the evaluation process.

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