Chapter IV

Psychological Principles for Reusable Learning Object-Based Learning System Design

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Abstract

The creation of a reusable learning object that is effective from instructional and system perspectives must be guided by a framework that is founded on theory and research. A combination of frameworks, the Cisco model and the grounded instructional systems design have been integrated to develop a set of templates that can be used to help developers efficiently create RLOs and the reusable information objects that comprise them. The integration of psychology foundation into learning object creation is critical to a successful implementation of RLO architecture.
Many approaches to the development of tools using learning objects reflect the focus of the United States federal government’s advanced distributed learning (ADL) initiative, which is directed toward the technological specifications and metadata standards that enable the reusability and transportability of learning objects across applications (Singh, 2000). Less attention is generally directed toward the integration of sound instructional design principles, particularly grounded instructional design theory, in the development of design tools for object-based learning systems (Wiley, 2002). Even less attention is paid to the underlying theories that should frame the development of the learning object and the resulting instruction.

To respond to these issues, a set of theoretical constructs can be merged to create a heuristic that can be used throughout the design and development process. Hannafin, Hannafin, Land, and Oliver (1997) have suggested an underlying theoretical concept of five dimensions using a grounded learning systems design model to structure design, development, and implementation of learning environments. Dimensions of psychological, pedagogical, technological, cultural, and pragmatic serve as a framework for examining integrated learning object-based instructional systems development. Such systems possess characteristics, features, and processes that embody the theoretical foundations and reflect the contexts within which those processes are developed. The framework may be used to organize, as well as characterize, the links between practical expressions and the underlying theoretical concepts of systems.

The focus of this chapter will be the description the fundamental properties of a reusable learning object-based learning system and specifically examine psychological concepts and supporting tools that promote successful implementation. An examination of these concepts and their implications provides insight to individuals who design, develop, refine, and adapt tools that focus on learning object architecture.

Why the Sense of Urgency?

Web-based delivery is a common distributed learning technology often embraced by institutions and organizations with a certain degree of urgency. Demand for the production of Web-based instructional programs is great, but resource inadequacies for their production threaten their timeliness (Hawkins, 1999). Production problems for a distributed learning program are compounded by the unique demands of Web-based instruction, particularly if developers choose to follow traditional theory-based instructional design models. Using a system as the one suggested by Hannafin et al. (1997) permits a framework that addresses alignment early in the design process so
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