Chapter VIII

Teaching Frameworks for Context-Rich Instruction: Design Objects

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Abstract

This chapter proposes a category of tools called design objects that can be used by instructors to integrate existing content sources, including but not limited to learning objects, within teaching frameworks that engage learners with content in meaningful ways. Emphasis is on tools to support the K-12 instructor, although related issues are applicable across educational levels. Examples of teaching-oriented design objects are provided along with related development systems, however it is argued the former represent more viable options for teachers given limitations in the learning object economy, conceptualizations of teachers regarding objects, complexity in packaging objects, and classroom control issues. The possibility of design objects and development systems working in tandem is discussed, with development systems prescribing effective educational strategies for novice teachers and design objects supporting more personalized content development. Various sources for new design objects are suggested to encourage further development and research.

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One of the primary assumptions and touted benefits of learning objects is that they will be reused by others and thereby reduce replication effort and cost. This assumption may be faulty, however, based on instructor difficulties in removing context from others’ learning materials that may be inappropriate for their own classes (Parrish, 2004). In fact, the reusability of a learning object is thought to be inversely related to the amount of its internal context, leading many to decontextualize learning objects to boost the likelihood they will be reused (Wiley et al., 2004). Given that many learning objects are very small, covering only one objective or content chunk (Bradley & Boyle, 2004; Duval, Hodgins, Rehak, & Robson, 2004), context is often stripped that might provide cues to the big picture of how discrete content meshes with a broader topic. Obvious problems ensue from over decontextualizing, given recent attention in learning theory on the benefits of contextualizing content in anchored or situated formats (Cognition and Technology Group at Vanderbilt, 1993; Garrison, 1995). A challenge is left with teachers, then, to piece back together a number of disparate resources into a meaningful collection for their learners, and to design activities and provide tools that provide for learner interaction with these materials.

Partially addressing this dilemma of too-much/too-little context in learning objects are “design objects.” Design objects are empty instructional design shells that facilitate the generation of an instructional sequence known to be effective in supporting a specific thinking process or type of learning (e.g., reasoning, inquiry, case analysis). Design objects provide a structure for content and activities to be specified by each instructor, which may or may not include existing learning objects, and they also provide the functionality necessary for students to carry out assigned activities. Thus, the “design” in design objects refers to not only the teacher’s instructional design, but also to the students’ original knowledge designs created by manipulating the structured material according to the manner specified by the teaching framework. In most design objects, the manner in which students manipulate rich resource sets is consistent with constructivist approaches to teaching. For the teacher, a design object supports multiple incarnations of a teaching strategy such as concept mapping or a teaching/learning model such as problem-based learning (PBL), instead of forcing the instructor to adopt or adapt activities created by others. The design shell and its underlying strategy or model are replicable and reusable, while the contextualized content specific to a course remains locally defined.

Open-ended and empty design objects empower instructors to infuse relevant context from their own courses and possibly from existing learning objects when appropriate. Design objects may inherently support higher-order learning from Bloom’s taxonomy (i.e., analysis, synthesis, evaluation), given their close connection to authentic or context-bound situations that often require higher levels of thinking.
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