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Great Expectations and Challenges for Learning Objects

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Some educators say that learning objects could be the wave of teaching and learning's future and vehicles for change in higher education. If educators successfully develop high quality learning objects that are well defined and easily reused, then these digitized "chunks" of information could be recombined in learning activities to meet learning's complex aims and a learner's particular needs. This approach sees learning objects as building blocks that offer creative possibilities for customization and flexibility in learning activities.

For such changes to occur, learning objects must not only aid learning, but also be widely used. Several repositories for learning objects exist and continue to be developed. (See <http://elearning.utsa.edu/guides/LO-repositories.htm>) But objects in the repositories are not ubiquitously used. Disagreement exists over what constitutes a learning object, how to differentiate the eclectic array of items in repositories, how to determine item quality, how to appropriately create and use items, and more. Questions remain concerning the manner in which using new technologies — with learning objects representing a particular, perhaps significant, case — might substantively change the way teaching and learning occurs. With this in mind, a brief overview of just a few challenges in

creating and using learning objects well might also temper great expectations for transformed teaching and learning practices in the near future.

Designing Learning Landscapes

History suggests that people often misunderstand powerful new technologies at first, trying to use them to address challenges in traditional ways. Later, after much experimentation and thought, they realize that the new technologies require the reorganization of human and financial resources, thereby creating new potentials for human processes (Christensen, 2000). For example, it is not new to have students memorize the details of a subject area, even if the details arrive in a digitized form. It is a different proposition, however, to ask students to systematically contextualize details, interactively using new technologies to mediate and assist in the process. Here, students might use technology to associate themselves in relation to other people, cultural perspectives and views of events or practices as an integral part of acquiring certain knowledge and skills.

To use learning objects as building blocks for a particular student's learning activities represents a significant departure from traditional instructional design practices. Most current practice in teaching and learning assumes that a whole course or a whole unit of instruction is designed, built, and delivered as a package to learners either face-to-face, electronically, by mail, or a combination of the three. Traditional course development involves setting learning goals and objectives that correspond to activities, often integrated in a sequential fashion, to engage students in using concepts and skills thought to enable realizing course aims. Usually, students participating in the same class section will be exposed to the same sets of learning activities.

In contrast, if learning objects are used as building blocks for learning activities for a particular learner's needs, faculty and students may use the blocks in highly creative construction processes. Developers of learning activities, be they faculty or students, may fit objects together from same-subject or other-subject repositories that help meet particular learning objectives. The result is flexible learning activities that may or may not require direct faculty facilitation in the learning process, depending on a learner's needs. Obviously, the scenario suggests a continuum of construction

possibilities, from teacher-developed to learner-developed.

Challenges

Such proposed new practices present several challenges, only three of which will be briefly outlined here: 1) deciding how to design learning objects; 2) deciding the best use of learning objects; and 3) understanding the theory and related assumptions that underpin the use of learning objects to benefit learning.

Design Issues. Since a major value of learning objects may reside in their reusability, perhaps across many different subject areas, then designers and programmers must consider how large the learning object should be and how the object should be "tagged" or programmed so that it can be assembled and reassembled over time. Some suggest that designers must decontextualize the objects, deconstructing materials into their component parts to enable different approaches to their re-assembly to meet individual needs. But how big should a learning object be to be useful? If the learning object is too small, the effort to manage pieces — like graphs, charts, text and pictures — might consume human patience, not to mention technology systems (Long, 2003). Another obvious challenge is that most existing content must be re-designed and turned into a system of learning objects in order to use it in the new ways proposed. Further, even existing learning objects often need to be reformatted to be used with existing learning systems and other developing systems of learning objects (Wiley, 2003). For reuse to work, developers must develop standards for producing learning objects that allow for easy storage, retrieval, and use.

Utilization Issues. Foundations, corporations, and governments have provided substantial support for developing technology-based learning resources in recent years, with many variations in emerging products resulting. At the same time, literature is surfacing that explores differences between learning materials, learning resources, and learning objects, also suggesting that the larger education community is not familiar with these terms (Ip, Morrison & Currie, 2001).

Faculty who experiment with learning objects face a myriad of choices. The MERLOT Project, which contains independent

"chunks" of materials—objects of many sizes, shapes, and textures—is one example. Another place is MIT's OpenCourseWare Project, which functions for the moment more like digitized materials associated with a course syllabus. Each of these initiatives raises intellectual property issues early in the design process, in turn creating Web-based repositories in an "open source" environment, free for noncommercial uses. Still, these efforts and others are more akin to publishing enterprises and thus share a particular liability of any publishing concern – how to get practitioners to use what is available, even when it is free. Further, the materials in such projects require considerable effort to locate and then transfer to another learning environment. More important, the mere use of digitized materials does not necessarily represent an effective technology-mediated transformation of learning (Twigg, 2003).

Theoretical Issues. David Wiley (2003) points out that three assumptions have colored designers' decisions regarding many learning object efforts: 1) individualized instruction is preferred; 2) human interaction in large scale learning environments is economically impossible; and 3) automation through technology-assisted instruction is the only solution to providing "anytime anywhere" learning. Wiley further posits that these assumptions contradict recent research on learning.

For example, while the instructional design behind learning objects is moving toward decontextualization, modern learning theory increasingly stresses the importance of context in learning. Learning objects often exist as inert "chunks of content," while learning theory is arguing for more instructional strategies such as case-based learning scenarios that involve problem solving and that use tools thoughtfully integrated to inform and be a part of learner actions. Wiley finds it paradoxical that we would put learners "in front of technology so that they can retrieve data from a supposedly intelligent machine…" further suggesting that "mainstream approaches to using learning objects present learners with one world view and no opportunity to experience alternatives, hear the stories of Others, or ask meaningful questions…"(Wiley, 2003, p. 3).

In short, how we conceptualize, design, and use learning objects will determine whether they aid learning. Theory suggests that benefits

accrue to efforts designed to reinforce higher order learning that involves analysis, synthesis, evaluation, and application—skills for a lifetime of learning—and not just to digitizing ways to recall details, order facts, paint by numbers, or match associated pairs for the short run. For this to occur, an emerging conversation suggests that several kinds of expertise must be brought to bear on object design and use, with clear delineations in the process between learning technologists, subject matter experts, and instructional designers (Ip, Morrison & Currie, 2001).

Dreams, Strategies and Tactics

The new technologies' transformational power resides in the complex volumes of data that can be stored, retrieved and used in innovative ways. Whether in text, audio, simulations, or other visual media, content or processes embedded in learning objects can be organized and analyzed in sophisticated ways, with learning activities represented in significantly different forms. Because new technologies permit such usage, some might say that they argue for or even demand careful experimentation and application. "They also argue for learning organizations that are capable of working at the same scale and complexity, enlisting a multitude of talents, training, and abilities in order to exploit the technologies' potential power" (Howard, 2002, p. 2).

In support of this notion, Wiley and others argue for using "open source" projects like Stanford's Creative Commons or Rice's Connexions to create electronically accessible spaces where people can experiment with and learn from using new technology-enriched resources. Encouraging students to use learning objects to solve problems, explicate cases, and analyze scenarios may provide life-long benefits to their learning processes.

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