Reusing Online Resources: A Sustainable Approach to E-learning

Allison Littlejohn, editor
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Reviewed by Patricia McGee

Reusing Online Resources: A Sustainable Approach to E-learning begins by pointing out that by the year 2025, the number of students attending universities is predicted to expand from an estimated 70 million today to 160 million. It is unlikely that brick and mortar facilities can meet the demands of this growing population, which is increasingly mobile, culturally unique, and geographically dispersed. The demand for and adoption of online learning systems has triggered a need for reusable resources, currently conceptualized as learning objects. The concept of "learning object" has come to represent any digital resource that supports learning, can be reused in different contexts and across systems, has an indefinite shelf life, and can be accessed by the learner regardless of location or learning environment.

The size of an object, or granularity, is a critical and oftentimes contentious theme of learning objects that reoccurs, appropriately, throughout this book. Granularity holds implications for production, storage, management, and pedagogical design and for costs associated with all of these processes. This book examines the current status of learning objects in educational settings and provides cases as well as strategies for learning-object initiatives.

The value of this book is multi-fold. First, it represents theory and practice that explain the nature of and functions associated with reusable resources. Second, the contributing authors are truly international. The breadth of expertise in this growing field is well represented. Third, the book is organized around key issues: theoretical perspectives, educational design perspectives, educational resource perspectives, and strategic perspectives. As noted by Terry Mayes in the book's introduction, the contributors clarify the breadth of objects for learning and expand design and utilization issues often portrayed in narrow and well-defined contexts. The comprehensive overview makes this book a required read for those institutions considering learning-object programs or those who want to understand what is needed to use them effectively and efficiently. (Note: This book is supported by a dynamic Web site, <http://www.reusing.info/>.)

Part 1 explains the theoretical issues that drive the design and organization of learning objects. It begins with a discussion of granularity in terms of level and disaggregation. Granularity refers to the size of an object (in terms of kilobits and megabits) as well as the breadth and depth of the content. Small objects that focus on a concept or principle are highly reusable, whereas large objects that contain more complex information are less likely to be reused. An overview of instructional processes associated with learning objects begins with a discussion of the stages of institutional adoption of learning objects and describes how to locate, access and utilize, reuse and adapt, and structure objects within a learning environment, as well as to identify the purpose and assess the quality of those learning objects.

Next, a learning object economy is described, along with the drivers that can sustain such an economy and the barriers that can defeat it. A comparison of different types of functional objects (knowledge, tool, monitor, text, and resource organization) introduces the challenges of reuse within pedagogical designs as well as a design for an integrative framework for a unit of learning that incorporates activities, supports, and services. Part 1 concludes with an overview of the Open Knowledge Initiative. This overview explains open learning for reusability and pedagogical flexibility for design based on learning principles.

Part 2 examines design perspectives on granularity, accessibility, and scalability as they relate to educational design. A design of generic learning activities shifts teaching from a transmission model to a construction model, illustrated by Laurillard's Conversational Framework for learning. This iterative process requires learners to engage, act, and reflect upon what they know and how they come to learn. An analysis of scalable (individuals or groups) and sustainable (efficient and economic) learning designs addresses how to design for diverse learner experiences, goal-based learning, reuse of objects, use of online learning tools for learning outcomes, clear and succinct instructions, and dynamic technology function.

Specific recommendations are made for the design objects to be used in multiple courses. When multiple applications are considered at the design stage, there is an increased likelihood of increased reuse across disciplines. Additionally, objects can be easily re-versioned depending on needs of new or revised courses, and pedagogy is wrapped around objects, activities, and supports. Part 2 ends with the often overlooked but critical issue of accessibility guidelines as for learner-centric models of repositories that allow users to reassemble objects in ways that best support their learning requirements.

Part 3 takes a resource perspective and reviews how objects are used, the influence of context on a resource, learner support, and sharing resources across systems. Libraries and repositories are a logical location for learning objects, although these traditional holding tanks are associated with traditional paradigms (cataloguing, maintenance, copyright) that do not reflect the new role of the librarian. A discussion of implementation issues describes the drivers and barriers to collected materials, reflecting the growing demand and the often-heard dilemmas of isolated development, lack of standardization and interoperability, and institutional attitudes toward such management.

The next section in Part 3 describes interoperability standards and reuse specifications: what they are, how they differ, and why they are important, whether or not an institution is building or using learning objects. A strategy for the reuse of digital images involves categorization of images and then examines how images best support learning within different pedagogical designs.

Learner assessment, a neglected topic in learning object literature, is illustrated in a project involving question banks. This project serves as a form of computer-assisted assessment that allows timely and supportive feedback to learners about their progress.

Part 3 concludes with a description of transnational networks and learning objects in the Collaborative and Network Distributed Learning Environment (CANDLE) project. This multinational project for sharing resources has been designed with a methodology for granularization, tools to support sharing, and exemplary courses to illustrate method and outcomes.

Part 4 explores the infrastructure, institutional culture, and pedagogical issues that surround use of learning objects. The effects of sharing resources within an institution and of inter-institutional relationships are examined in a discussion of the gap between technology and pedagogical developments, on one hand, and, on the other, the status of faculty in the process of adoption and their beliefs about technological innovations. Polarity theory is suggested as a strategy to identify a "zone of effective change." Factors involved in sharing objects across educational systems are described, and a model for a pedagogical framework that supports adaptability for levels of education is put forth. An incremental approach to staff development prepares educators for the effective use of learning objects ranging from basic (using directories/repositories), intermediates (developing, authoring, and sharing), and advanced (course design and development). Part 4 closes with a plan for reusing resources within communities of practice through e-workshops in which community members' tacit and evolving knowledge is accounted for and nur-

tured. Online Tutoring Skills (OTiS) is an e-workshop model that builds on stages of investigating practice. It serves as a model of community that allows for a range of roles and activities and provides a strategy for the reuse of case studies.

The usefulness of each chapter will be determined by readers' experience with and interest in learning objects, as well as by the roles they play within their institutions. Fortunately, the strength of this books lies in its commitment to a discussion of the learning in learning objects, an often overlooked and underdeveloped topic in the existing literature. Areas that need to be addressed in the learning-object discourse community are not all fully developed: the use of learning objects in PK–12 and training, and how this informs and relates to higher education; how learning objects can be used to support critical thinking in collaborative

activities; and how learning objects can be pushed to the learner rather than stored in silos that require searching and discovery.

The National Learning Infrastructure Initiative (NLII) is working to respond to these issues through several projects, all of which draw upon learner-centered principles (see <http://www.educause.edu/nlii/keythemes/lcp/>). NLII's Learning Object Workgroup is developing an ontology that will address the key issues in learning objects across disciplines and contexts. The work of this group is extended and contributed to by the Learning Object Virtual Community of Practice, an international group that engages in research and learning activities. *e*

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