Chapter XXXV
Applying Learning Object Libraries in K-12 Settings

Sebastian Foti
University of North Florida, USA

ABSTRACT

The author describes the work of Dr. Mary Budd Rowe and the establishment of an early learning object databases. Extensive training with K-12 educators left two lingering issues about learning object library implementation: the question of granularity, and the perceptual chasm between developers of learning object libraries and the practitioners who will ultimately retrieve the objects. An examination of Dr. Rowe's projects, including Science Helper K-8, Culture & Technology, and Enhanced Science Helper provides insight into possible barriers to success when teachers use learning object libraries as a tool for lesson planning. An intelligent lesson-planning tool that populates a student-centered learning environment is proposed as a possible solution to overcome such barriers.

INTRODUCTION

Learning objects libraries have been around for well over 15 years and a great deal of effort has been put into their formalization. Indeed, it may be said that more attention is currently being directed towards the formation of such libraries than ever before. Planning groups, pilot programs, industrial libraries, and standards committees across the globe have been implemented and in some cases are running successfully. It is not altogether clear, however, if learning object libraries will ever be successful in mainstream K-20 educational settings. A "learning object is any entity, be it digital or nondigital that may be used for education and training" (IEEE, 2002, p. 6). A learning object library is a collection of such objects, along with facilities to retrieve them. Learning object libraries are the perfect computer application. They take the work of many and share it globally, make access to the materials simple and straightforward, catalog the materials by universally accepted standards, keyword, process themes, content themes, experience type, suitable learning style, and so on. It is a match made in Heaven: a world full of educational material, and a high speed, networked computer system. The merits of such a system are so obvious most advocates never even ask a very basic question. Unfortunately, we have learned that this question must first be asked: "If we build it, will they come?" Why wouldn't they come? As it turns out, there may be many reasons.

Learning object libraries, like all database systems, have an inherent bias: they are categorical. They maintain information in very specific ways. And teachers do not necessarily think so categorically about their curricula. Even simple databases are rarely used professionally by teachers:

Database design can help users to think relationally, in a detailed fashion, and in an inductive (in aggregating data) and deductive (in disaggregating information) manner. Yet, the conceptual and technical difficulty of databases renders them invisible in terms of classroom use….Complex software such as spreadsheets, databases, simulation software, statistical programs, or "mind tools," (so called because of their ability to promote higher order thinking) are most obvious in US classrooms by their absence. In tracking software use by 300 teachers with whom I worked over a four-year period, only about 12% reported spreadsheet use (mostly among math teachers and for purposes of creating graphs). When math teachers were removed from the equation, spreadsheet use fell to 2%. In eight years of classroom-based work with teachers, I have never witnessed database, GIS, simulation or statistical software use. (Burns, 2005, p. 3)

Apparently, problems with database use are not limited to teachers. In a study of collegiate business students researchers, Chen and Ray (2004) investigated the students' ability to solve a realistic business problem using a database software application. Students made a variety of mistakes applying the database in their work. For example, "the majority of queries were unnecessary queries," "6 of 11 individuals and 5 out of 9 teams performed no planning" (p.15) when using the database, and only one team and two individuals were able to make good conclusions" (p. 16). The researchers reported that "After exposure to numerous demonstrations and exercises involving database tasks such as creating queries, creating reports, and using online help facilities, students were not able to use these procedures to solve a business problem" (pp. 18-19). This suggests that understanding how to use database search facilities is not adequate preparation for solving problems that involve the use of the database.

In the United States, most curricula are aligned with national standards of one sort or another. Most science curriculum developers are well versed in the National Science Education Standards. Individual states have developed their own standards, sometimes deviating from the national standards and sometimes remaining relatively close to them. Teachers are aware of the standards and know they are teaching the appropriate standards for their grade level. However, and this is important, do the teachers really think about the standards when preparing their lessons for the following day? Our experiences indicate that they rarely do, but rather, focus on specific content. This may not matter, since in the United States at least, the textbook companies have taken care of the application of the standards for them. The standards compliance requirements that states and districts demand of textbook companies are systemic enforcers of "best practice" or "expert thinking." Even when states and districts develop curricula, the instructional designers seldom consider the full potential of teachers as codesigners of curriculum materials. Traditionally, curriculum designers view teachers as either transmitters of the intended curriculum or as active implementers of the curriculum materials (Connelly & Ben-Peretz, 1997).

Related Content

History of Distance Learning Professional Associations
Irene Chen (2011). *Instructional Design: Concepts, Methodologies, Tools and Applications (pp. 162-172).*
www.irma-international.org/chapter/history-distance-learning-professional-associations/51816

Improving Literacy Instruction Through University and P12 Partnerships: Using the SPICE Early Literacy Grant to Foster Literacy Instruction
Charles William Kemp, Sandra Lee Beamand Kimberly D. Cassidy (2022). *Collaborative Models and Frameworks for Inclusive Educator Preparation Programs (pp. 56-69).*
www.irma-international.org/chapter/improving-literacy-instruction-through-university-and-p12-partnerships/309338

Improving Learning Achievement in Science Education for Elementary School Students via Blended Learning
Ren-Hung Hwang, Hsin-Tung Lin, Jerry Chih-Yuan Sunand Jang-Jiin Wu (2019). *International Journal of Online Pedagogy and Course Design (pp. 44-62).*
www.irma-international.org/article/improving-learning-achievement-in-science-education-for-elementary-school-students-via-blended-learning/223901

Engineering Education for All: Increasing Access to Engineering Education for Men and Women across the World through Distance Learning
Roofia Galeshi (2017). *International Journal of Online Pedagogy and Course Design (pp. 35-47).*
www.irma-international.org/article/engineering-education-for-all/176612

Expanding Learning Opportunities for Graduate Students with HyFlex Course Design
Mariam Mouse Matta Abdelmalakand Julia Lynn Parra (2016). *International Journal of Online Pedagogy and Course Design (pp. 19-37).*
www.irma-international.org/article/expanding-learning-opportunities-for-graduate-students-with-hyflex-course-design/162681