

Special Issue

Learning Objects

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INTRODUCTION

In *Understanding Media*, McLuhan suggests that the content of any new medium, at least initially, is provided by the medium that it is in the process of supplanting (McLuhan, 1964): the content of early writing, as in Homer's *Odyssey*, is the spoken word; and the content of early cinema has been identified as theatre or vaudeville (e.g. Manovich, 2001; p. 107). Developments in Web technology and the use of this technology in education have also appeared to follow this pattern. Exclusive concern with document appearance and presentation – characteristics inherited from the print world – are gradually giving way on the Web to multimedia formats, and dynamic and distributed organizational mechanisms. Similarly, in online learning, the Web initially took as its content the lectures, overheads, discussions and other aspects of the traditional classroom. Many of these aspects – down to the closed classroom door, the obligatory teaching assistant and the classroom whiteboard – have been faithfully transferred onto the Web via password-protected course management systems like WebCT and Blackboard. However, attempts to replicate the face-to-face classroom seem to be giving way to distributed systems of “learning objects” that exploit the intrinsically decentralized and modular nature (Manovich, 2001) of Web-based content.

The vision of reusable digital learning resources or objects, made accessible through coordinated repository architectures and metadata technologies, has gained considerable attention within distance education and training communities. Governments and other institutions around the world are spending large sums of money on initiatives that promise the development of learning objects, learning object metadata and learning object repositories to store both this data and these objects. In plainer language, learning objects can be said to refer to digital educational resources; metadata refers to their systematic description to facilitate searching and administration; and repositories represent online, searchable collections of these resources. Examples of initiatives underway include the Curriculum Online project being undertaken for schools in the UK at a cost of approximately \$500 million, and the Australian Learning Federation, a project similar in emphasis with a \$30 million budget. Similar projects are also being currently undertaken in Canada (e.g. eduSource, 2004; Industry Canada, 2005), the US (e.g. HEAL, 2004) and by regional and international consortia (e.g. EducaNext, 2005).

In the fall of 2003, it was suggested that a conference or summit on learning objects would be a welcome addition to work occurring in the context of the eduSource project (www.edusource.ca). eduSource was a pan-Canadian initiative, in active development from 2003–2004, funded by the

Canadian federal Government, and having as its goal the development of a network of learning object repositories that is international in its scope. The summit, held in Fredericton, New Brunswick, Canada, attracted approximately 150 participants, attending both face-to-face and virtually. The summit was conceived as a forum for the open discussion of technologies and critical understandings related to learning objects, repositories, and their educational application.

This issue is considered a capstone for the summit, and in some ways, it serves a similar purpose for the eduSource project as well. It brings together five of the many papers presented at the forum; and these five represent a diversity of perspectives and understandings of learning objects, and their technical, as well as social, economic and pedagogical ramifications.

CONTRIBUTIONS

The papers provided in this issue fall into two categories: three are polemical, and two are technical in character. The adjective “polemical” is utilized here without any pejorative intent, referring to writing that seeks to persuade its readers through reasoned argument and contextualized evidence. Perhaps more familiar to readers of this journal, however, will be the “technical” papers – attempting, as they do, to lay out a specific means or technique of solving a particular problem or challenge. Both of these technical papers focus on the challenge of effectively matching learning objects with their potential users, presenting different “filtering” technologies to achieve this end. In the case of the three polemical papers included in this collection, constructive arguments are presented related to issues of direct relevance to learning objects: copyright law and educational resource use; the rhetoric associated with learning object publications and justifications; and the intellectual heritage invoked in the term “object” itself.

The first polemically-oriented paper, authored by Rory McGreal, discusses the relevance of copyright and “intellectual property” legislation to the sharing and reuse of learning objects. One of the primary drivers of the development of learning object content and infrastructures has been the savings promised by the sharing, reuse and repurposing of digital resources. A number of projects and authors have envisioned the emergence of what has been called a “learning object economy.” These include the “Educational Object Economy Foundation” (www.eoe.org); one of the earliest learning object

repositories), the Co-operative Learning Object Exchange of Canada (<http://cloe.on.ca>), and articles by the likes of Downes (2001) and Polsani (2003). Whether this particular economy is conceived as operating in terms of a marketplace, potlatch or public service (or a mixture of these), clear and manageable terms of use and re-use for digital content is an important and necessary precondition for such an economy to flourish. Recent legislation and litigation, perhaps especially the Digital Millennium Copyright Act (DMCA) and actions of the Recording Industry Association of America (RIAA) has the potential to “put a chill” on the possibility of realizing a thriving learning object economy. Restrictive copyright has become, in effect, the default for digital content, leaving the legal implications of simple educational use in doubt – much less inviting unrestricted sharing, adaptation and reuse. McGreal convincingly shows how laws and litigation have already had this result, and that there are interests aiming to multiply this effect. However, McGreal also describes a number of alternative projects and proposes pieces of legislation that provide hope for a different outcome – one that would indeed be able to sustain the practices of a healthy economy of learning object exchange.

The second paper, by Anthony Roberts, comes from a disciplinary background with which some readers of this journal may not be familiar. This background is one that regards the pervasive and problematic nature of western philosophical presuppositions in technical, institutional and cultural activities as being of paramount importance. The term “learning objects” provides an obvious, if indirect or unconscious, reference to one of the most problematic of these foundational presuppositions: the possibility of an objective reality that exists and operates independent of human social constructions, interests and actions. The danger presented by these presuppositions on our everyday understandings can be readily illustrated by considering conceptions of gender and race that have, in earlier generations, been accepted as “scientifically” or “objectively” true. Learning or software objects, with their “decontextualized” operation and their “black-boxed” complexity and function – theoretically independent of any relation to or knowledge of it – represent a forceful instantiation of the western notion of “objectivity.” In addition to showing how this notion is both problematic and self-contradictory, Roberts illustrates – using the rather involved example of the work of Maxine Sheets-Johnstone (Sheets-Johnstone, 1990) – how difficult it can be to effectively overcome this notion through reconceptualization or conceptual renewal. At the same

time, however, Roberts very effectively reinforces the common assertion that a re-definition of the meaning and implications of the term learning objects is an urgent task. If they are to find productive uses outside of basic training settings, as Roberts argues, learning objects must be understood in terms of the complex and reciprocal relation of their nature and use to their users and context(s).

In the third paper, Friesen takes up the frequent association and justification of learning objects in conjunction with the "information society" and the "knowledge economy." Just as Roberts traces the history or genealogy of the term "object" in Western thought, Friesen convincingly pinpoints the origin of "information" and "knowledge" as descriptors of social and economic organization in the early work of Daniel Bell. In *The Coming of Post-Industrial Society* (Bell, 1999), Bell explores the implications of post-industrial, information- or knowledge-centred new social and economic forms for society, the economy and education. Among these implications is the pre-eminent value and force of *knowledge* – specifically a paradigmatic, scientific kind of knowledge that Bell describes as being both "universal" and "disinterested." Because this knowledge is seen as the driving force of our society and economy, continuous ("life long") education and knowledge acquisition takes on great value. Many in the learning objects "movement" have uncritically taken up this line of argumentation, and presented learning objects as an excellent solution to meet the expanding need for effective knowledge acquisition and management. (Given Roberts' earlier arguments about the alignment of "object" and "objectivity" it should not be surprising that learning object advocates are legitimating their activities precisely in terms of a type of knowledge that is itself "disinterested" and "indifferent" as to context use and relation.) Like Roberts, Friesen also concludes by emphasizing that understandings are needed that reach beyond content as an indifferent "object." We are not at the inflection point of a new age, Friesen argues, but rather in danger about falling for the same old line about the epochal, revolutionary results of technology-driven change.

On the technical front, the fourth paper presented by Harold Boley *et al.* represents an attempt to provide more accurate return results for searches performed on learning objects, or more accurately, the metadata records associated with these learning objects. Working within a business model of seller (provider) and buyer (procurer), the article describes a search tool developed to return weighted results for potential customers. CanLOM, the Canadian

Learning Object Metadata repository developed for the eduSource project, is the testbed for this search tool. Employing the search tool, the user can set the desired level of importance for individual data elements specified by CanCore, an application profile of the IEEE-LOM. These elements include the title, description, intended end user, typical age range, technical formats, and copyright restrictions associated with the object. If users wish to retrieve learning objects of a certain technical format, say a JPEG photo, they can select this format as a search parameter, and can also indicate the value they would like to associate with this parameter, say 0.9 out of 1.0. Extensible Style Language Transformation (XSLT) and other technologies are then used to display results in a user-friendly way.

Finally, Danielle Lemire *et al* provide a paper showing how Semantic Web technology can be integrated with learning object repository infrastructures. The Semantic Web is an attempt to apply flexible but universally accepted approaches to the management of diverse Web contents. Many or all of the metadata elements included in the IEEE LOM can be used in a manner that directly complements the technology of the Semantic Web drawing on some of these elements, the authors present a way to search these elements using a markup language called RuleML. They show how this can be combined with a rule engine called OO jDREW to identify and predict user preferences. The paper further describes how these technologies were applied in a real world environment: a music site known as RACOFI Music, where users can rate music resources or "objects" on the basis of a range of attributes. The data generated through these rankings are then used to make recommendations for other users. By combining these technologies with inferential reasoning processes and user profile information, the authors predict that the technologies they have started to develop may be of great assistance in navigating complex and media-rich collections of learning resources.

CONCLUSION

Despite their apparent diversity, each of the papers in this collection can be said to treat a common and pressing issue in the deployment of learning objects and related infrastructures: *context*. The question of how discrete, digital learning resources can be combined with other resources, and can find their place in a learning sequence or experience remains central in learning object research. This question of contextual combination and integration invokes a wide

range of related issues and questions. These extend from questions of actually finding the right learning resource to be combined and utilized, to issues of the legal use and modification of the resource, and also to matters of the nature and utility of such resources as understood in larger social and even philosophical frameworks. By raising some of these questions, and (in some cases) providing some preliminary answers, the articles in this collection hopefully represent a valuable contribution to ongoing efforts and discussions that are being pursued in a range of settings across the globe.

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Anthony Roberts has been involved in the learning object repository and metadata repository projects since 1999 while working with the provincial Department of Education. Currently employed at Mount Allison University as an Educational Technology Consultant, Anthony has a diverse educational background that includes undergraduate degrees in chemistry, philosophy, women's studies and graduate degrees in feminist studies, critical pedagogy and environmental studies. Anthony is one of the founding members of CanCore and continues to work on the project. Formerly the chair of IMS's Metadata Working Group and co-chair of IMS's Accessibility Working Group, he currently administers WebCT, provides instructional design support for faculty and continues to work on diverse projects such as the Aboriginal Community Development Centre at Mount Allison.
