Learning Objects

EDUCAUSE Evolving Technologies Committee
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Introduction

Somewhere on your campus there are faculty who are fabricating strange entities called Learning Objects. They might not know that they are called Learning Objects, but that's what they are making. If you have access to resources that they might need -- programmers, designers, hardware, software, catalogers-- these faculty will come seek you out if they haven't done so already. This paper may help you be ready when they show up at your door.

What Is A Learning Object?

You may recall from your undergraduate theology class that during the Middle Ages, theologians and philosophers spent large amounts of time debating the precise number of angels that could dance on the head of a pin. The early learning object movement has spent similarly large amounts of time debating what the correct definition of a learning object should be.

Two quite sensible definitions have emerged. David Wiley defines a learning object as "any digital resource that can be reused to support learning" (Wiley, , while Larry Johnson from the NMC defines a learning object as "any grouping of materials that is structured in a meaningful way and is tied to an educational objective". (Johson, TK)

My advice to you is to not engage in this discussion. Knod sagely when asked and mutter something about how a strict formal definition is probably not that useful, and that your definition of an Learning Object is much more situational: is it used in the learning process? Call it a learning object. Think animation, simulation, interactive map, game, applet. Think re-usability in multiple contexts. There is a page at http://learningobjects.wesleyan.edu/about/examples.html that has examples. Look at those. You'll get the idea pretty quickly.

Why Are Learning Objects Important to Higher Education? OR Why Should You Care About Learning Objects?

Learning Objects matter to Higher Education because their use in particular instructional contexts provide new ways of visualizing, thinking about, presenting, interacting with, and understanding complex topics. While they are not a universal solvent, their use will
increasingly differentiate ‘old’ ways of teaching from ‘modern’ teaching techniques. While there is no definitive study that proves or disproves that the use of learning objects always improves learning outcomes, there is a growing amount of anecdotal evidence that suggests that rich media, when used effectively, improves student satisfaction, student retention, time-on-task, and other significant indicators. Well-designed learning objects allow students with different learning styles to interact with the materials according to their preferred way of learning.

While the production of learning objects is complex and costly, if one considers all of the money that is spent on course management systems, on computer networks, on multimedia classrooms, on instructional computing staff and training, on faculty development, then the costs, while still high, become comparatively less daunting. And the cost of use (not the production) is much, much less.

We are at a turning-point in the development of Learning Objects. There is an opportunity to create a diverse, global network of Learning Object developers, repositories, and users who if they can effectively organize and coordinate their activities, can produce a library of high-quality, pedagogically sound, free (or inexpensive) materials that will make all of the investments in infrastructure pay off in the educational experience of our students.

Key Questions to Ask Yourself About Learning Objects

If you wish to prepare in advance of being visited by the Learning Object zealots on your campus, it is worth considering a broad range of questions:

- Who on campus is involved in the production of Learning Objects?
- Who on campus is using other peoples’ Learning Objects in their teaching?
- In what specific ways are Learning Objects being used on campus?
- Should we partake of Merlot? (Not the wine, the Learning Object collaborative)
- Can we afford to make them?
- Can we afford to not make them?
- How do we integrate them into other parts of our teaching?
- How do we share them?
- What does it cost to make a learning object?
- What evidence is there that this approach to education actually works better than other approaches?
- How are other schools that we regularly collaborate/compete with ‘dealing’ with Learning Objects?
- Who ‘owns’ Learning Objects made on my campus? Are they like books or are they like software?

There are no right answers to any of these questions. Taking time to consider possible answers, and how these answers relate to other academic technologies on your campus can help clarify your eventual position vis-à-vis Learning Objects.
What Are The Implementation Challenges?

While it is somewhat odd to think of ‘implementing’ a learning object, it is worth considering two scenarios: creating a campus-culture and development infrastructure for producing learning objects (Scenario One) and creating a campus-culture for using learning objects produced elsewhere (Scenario Two).

Scenario One: Producing Learning Objects
In this scenario, you have committed to having the capacity to produce learning objects for use within your curriculum.

1. **Staffing**: To make high-quality learning objects in collaboration with faculty requires staff with a wide-range of skill-sets, including graphic design, programming, 3D modeling, instructional design, metadata production, and (obviously!) subject knowledge expertise. These people may already exist on your campus, but you will need to find a way to free up their time to be able to concentrate on this work.

2. **Standards**: While many organizations are working very hard to develop standards for interoperability, reusability, and durability, these are largely works-in-progress, which means that the materials you produce, unless you are very, very diligent, may not be easily shared, may not work well with other instructional systems on your campus, and may not continue to function in the future.

3. **Funding**: Learning Object production costs money. It takes time. It requires special software and sometimes special hardware. It requires faculty time (see below).

4. **Reward structures**: Before faculty will spend time doing something, they need to think about the reward structures within their institution and within their discipline. Will making a great learning object help them get tenure? Will it improve their teaching evaluation? Will it improve their visibility within their professional societies?

Scenario Two: Using Learning Objects
In this scenario, you are committing not to producing Learning Objects, but to promoting the use of Learning Objects made elsewhere.

1. **Explaining to others what learning objects are**: If you should happen to wake up tomorrow and decide that the future of your institution, and in fact the future of education, lies in learning objects, you will face a steep learning curve on your campus and beyond. Not only have most people never heard the expression ‘Learning Object’, but those who have usually don’t like the term. (Objections to LO)

2. **Finding appropriate examples**: Another challenge is finding appropriate examples to demonstrate the possibilities that Learning Objects afford the educational process. As one of our leading professors of philosophy recently pointed out to me “anything not worth doing is not worth doing well” which was his way of reminding me that bad or uninteresting ideas can seem cool and nifty to technologists, but can quickly and often
irrevocably turn off faculty from technologies that might in fact be useful (and worth doing) for some other purpose.

3. **Designing assignments that integrate the learning objects appropriately into the curriculum**: In general, figuring out strategies for integrating web-based materials into the classroom is still very much a work-in-progress. Learning Objects present similar challenges to instructors. Many of the repositories that provide access to Learning Objects also provide means for faculty to record their ideas for how to integrate the material into the fabric of a given course.

### Who Are The Major Players in the Learning Object World?

**ADL-Net**
http://www.adlnet.org/
The Advanced Distributed Learning (ADL) Initiative, sponsored by the Office of the Secretary of Defense (OSD), is a collaborative effort between government, industry and academia to establish a new distributed learning environment that permits the interoperability of learning tools and course content on a global scale. ADL's vision is to provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectively anywhere and anytime.

**Cancore**
http://www.cancore.ca/indexen.html
This Canadian project is creating a metadata scheme that is intended to facilitate the interchange of records describing educational resources and the discovery of these resources both in Canada and beyond its borders.

**IMS**
http://www.imsglobal.org
The IMS Global Learning Consortium develops and promotes the adoption of open technical specifications for interoperable learning technology.

**Merlot**
http://www.merlot.org
Merlot is a national learning object repository that contains thousands of items, many of which are peer-reviewed and annotated by people who have used these materials in their courses.

**New Media Consortium (NMC)**
http://www.nmc.org
The NMC has published a number of important white papers on Learning Objects, and recently published helpful guidelines for learning object authors. A direct link to their Learning Object site is at [http://www.nmc.org/projects/lo/index.shtml](http://www.nmc.org/projects/lo/index.shtml)

**NLII**
http://www.educause.edu/nlii/
Educause’s National Learning Infrastructure Initiative took up Learning Objects as a key theme in 2002-03 and produced a number of useful documents during that time. See
When Will Learning Objects Become Essential on Campuses?

Depending on who you ask, many people consider PowerPoint presentations and QuickTime movies to be learning objects, in which case one could plausibly argue that Learning Objects are already essential on your campus even if nobody calls them Learning Objects. As more and more classrooms get wired for multimedia, as more high-quality materials become available, as faculty develop sustainable and effective strategies for integrating Learning Objects into their courses, then there will come a time (as it was with email) when it will be hard to teach many (but not all!) courses without them. When will that be? It depends on the discipline. In many of the sciences, it is already the case.

How Are Learning Objects Evolving? Where Are The Likely Impacts In The Coming One to Three Years?

In the late 1990s, the part of the Department of Defense involved in education declared that going forward, any vendor that wanted to do business with them had to conform to a standard that they invented call SCORM, which stands for Sharable Content Object Reference Model. Given the size of the DOD’s budget, unsurprisingly, all of the major software vendors that traffic in tools and technologies having to do with Learning Objects have declared their commitment to SCORM, which means that (among other things) we should see in the not-too-distant future a world where Learning Objects can ‘talk’ to each other, and share components with each other, and interact with Learning Management Systems (e.g. WebCT/Blackboard/Sakai/Moodle). The tools for Learning Object production are also becoming increasingly easier to use. Faculty increasingly think in terms of multimedia, partly because the younger faculty have grown up in a world full on Game Cubes and X-boxes, and partly because there are increasing numbers of good examples that they can look at and try to emulate. Most visions of the future of learning objects predict a robust albeit complex mixture of learning object producers made up of commercial and academic publishing houses, academic institutions, professional societies, and other consortial entities, while the vast majority of faculty (and perhaps institutions) will opt to be learning object consumers, and will avail themselves of these materials within the context of a learning object marketplace. The shape of that marketplace is very much up for grabs.

What Are The Issues To Be Addressed?
As indicated by the myriad campus-specific questions one needs to consider before diving into the world of learning objects, there are broad issues that go beyond the particulars of any given institution that are challenges to the adoption of learning objects within any given campus’ curriculum.

1. **Standards and Longevity:** What is the average life-span of a learning object? How can we make sure that the materials we develop are as generic as possible while still being interesting? How do we choose the right technologies to make sure that the promise of re-usability is achievable?

2. **Rewards:** Why would a faculty member want to spend time working on the development of a learning object? What is the reward for spending time doing this?

3. **Funding and economic model(s):** Who will pay for these materials to be created? Will a vibrant learning object economy emerge? Is there an opportunity for entrepreneurial activity by institutions that have the resources to engage in the marketplace? Will the commercial and academic presses figure out ways to deconstruct their existing products into smaller chunks and to make these smaller chunks available via Digital Rights Management? Will a grass-roots movement akin to the creative commons and the Open Archives Initiative emerge and carry the day? Can all of these models co-exist?

4. **Coordination of development:** How can we better plan and communicate our plans for development so that we don’t all make the same Learning Objects on our separate campuses?

5. **Coordination/federation of repositories:** How can we make sure that the materials we create on our campuses end up being represented in the various learning object repositories?

6. **Documentation of use/value within curricular settings:** How can faculty be convinced to take time to document how they are using learning objects in their courses? Will this documentation help to improve the education on our campuses?

**Conclusion**

Unlike a payroll system, or a campus network, or even email, it is quite possible to imagine choosing to ‘skip’ Learning Objects and wait for the next wave of new technology to replace it. To do so, however, is both impossible and a mistake. Impossible because unlike a new payroll system that requires authorization and input from the central administration,
Learning Object use is almost certainly already happening on your campus, and very likely there are early adopters who are busily creating these materials with or without your knowledge. More importantly, it is a mistake to not engage with this new way of thinking about instructional technology, because it is our collective responsibility to shape the future of how this new medium can help our faculty and students (and therefore our institutions) achieve their educational goals.

Related Higher Education Projects and Other Readings

Links to other Learning Object initiatives and key readings can be found at http://www.lolaexchange.org/readings/.

Related Educause ’04 Sessions

Seminar 02P - Decentralization of Learning Resources: Syndicating Learning Objects Using RSS, TrackBack, and Related Technologies
PLEASE NOTE: Separate registration and fee is required to attend this seminar.
1:00 p.m. – 4:30 p.m. Tuesday

Object-Oriented E-Education for PK-16 Students and Teachers
Session DetailsPoster Session - Emerging Technologies
Thursday, October 21
4:55PM - 6:10PM
Exhibit Hall A, Table 05

The TALON Learning Object Templates: Reducing the Costs of Online Curricula
Session DetailsPoster Session - Emerging Technologies
Thursday, October 21
4:55PM - 6:10PM
Exhibit Hall A, Table 20

Making the Most of What We’ve Got: Managing Digital Content from Online Courses
Session DetailsTrack 6
Friday, October 22
9:30AM - 10:20AM
Meeting Room 607

Media-Rich Interactive Courses and Sites for Student and Faculty Support
Session DetailsPoster Session - Teaching and Learning
Thursday, October 21
4:55PM - 6:10PM
Exhibit Hall A, Table 30

Seminar 09A - Corralling Educational Content: From Learning Objects to Knowledge Networks
PLEASE NOTE: Separate registration and fee is required to attend this seminar.
Session Details
Morning Seminar
Tuesday, October 19, 2004
8:30 a.m. - 12:00 p.m.
Meeting Room 102

NLII Learning Objects VCOP (LOVCOP)
Session Details
Meeting
Tuesday, October 19, 2004
3:00 p.m. - 5:00 p.m.
Gold Room, Hyatt Hotel

Use of Learning Objects to Develop a Mobile Learning Fieldwork Course
Session Details
Poster Session - Emerging Technologies
Wednesday, October 20, 2004
4:55 p.m. - 6:10 p.m.
Exhibit Hall A, Table 13

Converting Existing Online Courses to Learning Objects
Session Details
Track 6
Thursday, October 21, 2004
8:10 a.m. - 9:00 a.m.
Meeting Room 201