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Places to Go: Connexions

by Stephen Downes

When compared with, say, blogging, the deployment of learning objects has been slow indeed. While blog aggregation services are recording millions of blogs and hundreds of millions of blog posts, academic learning object repositories number their resources only in the thousands, and even major corporate repositories have only one or two million learning objects.

A blog post is, of course, a much simpler entity to create than a learning object. But aside from this internal complexity, there is a remarkable similarity between the creation of blog posts and the creation of learning objects. Each is intended to be a minimal unit of content, a part of a larger whole, and to be shared and repurposed by aggregators, other writers, and eventually, readers or students.

One reason for the dearth of learning object production may be the lack of an effective distribution system. Learning object metadata (LOM) is more difficult to use than the RSS metadata used by blog posts, and software programs that collect and read LOM are few and far between. But even the best distribution system cannot address the other major reason: There has never been a simple means of creating learning objects; there has never been a Blogger or a LiveJournal for the educational community.

This month's place to go is an important step in that direction. Rice University's [Connexions](#) is a one-stop service that allows educators to create learning objects, instructors to assemble them into modules and courses, and readers to learn from the educational resources thus created. And because the site employs the Creative Commons license, materials created by authors may be freely shared by other authors and readers.

First-time visitors to the Connexions Web site will want to scroll past the introductory message in the center column and click on the [About](#) link. This takes you to a simple description and, on the right, access to a [white paper](#) (PDF), a [statement of philosophy](#), the [Frequently Asked Questions](#) page, [news](#), and more.

Connexions's [philosophy](#) will sound remarkably familiar to members of the blogging community: "When people share their knowledge, they can select from the best ideas to create the most effective learning materials . . . we store content in XML, which ensures that it works on multiple computer platforms now and in the future. . . . open-content licenses make it easy for authors to share their work—allowing others to use and reuse it legally—while still getting recognition and attribution for their efforts" (par. 2).

From the About page (and also from the home page) readers may opt to take a [tour](#) of the Web site. The tour normally opens in a pop-up window, but users of advanced browsers, such as Firefox, will need to click on the manual link to override the pop-up blocker. Twelve quick and visually attractive pages later, the reader will have a good overview of what Connexions is about.

The core of the tour is Connexions's "five principal components." We have seen some of these already—modular content, a culture of sharing, and content-creation software. Also worth noting is the site's approach to [quality](#): "Traditional publication employs a pre-publication peer review process . . . Connexions opens up the editorial process to third-party reviewers for post-publication review. While Connexions users will have access to all content in the Commons (of any quality), users will also have the ability to preferentially locate and view Modules via Lenses, each of which have a different focus provided by a third party" (pars. 1-2).

On completing the tour, return to the [home page](#) in the separate browser window. The upper left portion of

the home page features tabs that allow primary navigation through major areas of the site; in addition to links to the home page and the About page, readers may also click on [Content](#), which provides access to learning objects already created by Connexions members, and [Software](#), which lists a set of tools released by the Connexions project.

Clicking on [Content](#) leads the reader to a page featuring links to a course list and access to all content, sorted by popularity, title, author, and keyword. Clicking on the course list sorted [by title](#) leads you to, say, [The Basic Elements of Music](#) by Catherine Schmidt-Jones. The course displayed is typical of Connexions courses: a title and outline occupy the main part of the page, and a table of contents is contained in the right-hand column.

The course outline also provides a link to a [Roadmap](#) utility available for Netscape and Mozilla browsers (it did not appear to install properly in Firefox). This tool allows you to display the course table of contents in a sidebar while browsing course materials. Users of other browsers need not worry, however: the Roadmap is strictly an extra, and the course is easily navigable without it.

Click on [Start Course](#). The display looks like the beginning of a Web course at first glance—there is some text (in this case, an introduction to Rhythm). There is a link to the course contents in the upper right and next to that a link to the next page. At the bottom of the page are further links for navigation, including a link to the discussion forum. Look more closely, however, and you will see that you are in fact located in a stand-alone module. Moreover, in the left-hand column is a list of links to similar content and to other courses using the same module. This allows the reader to escape the bounds of the course and explore the subject area as a whole, not merely the subject area as envisioned by a single course author.

Indeed, after navigating through courses for a while readers may find themselves starting directly with a module. For example, one of the most popular modules on the site is the [Circle of Fifths](#). This module is included in Schmidt-Jones's Introduction to Music Theory course (as we are informed in the left-hand column). Being further into the course, this particular module requires prerequisite modules that illustrate musical intervals as well as major and minor keys; these prerequisite modules are displayed at the top of the left hand column. Thus a reader searching or browsing on a module-by-module basis would not be simply abandoned in difficult material; the connections to related and required pre-reading are easy to find.

After viewing a number of modules, the reader may want to become a writer. The best path is to click on the [Quick Start](#) link in the upper right corner of the home page. The first thing writers will need to do is [request an account](#), a seamless process that takes seconds. Writers are then referred to the [New Author Guide](#), which outlines the creation process. The first step, as may be imagined, is to create a series of modules; once modules are created they may be assembled into a course.

Writers have their own personal work area called "My Workspace." A link to this workspace will appear in the left-hand column of the home page once the writer has logged in. Clicking on the link takes the writer to a list of courses and modules created or being created. Writers may also create a new module or course or search for work created by others. Others' material found via the search may be imported into the writer's own workspace; new writers should import some modules to get a sense of what completed modules look like from the author's perspective.

Clicking on a module title leads to a module editing page. Modules in Connexions are defined using an XML format called CNXML. Designed specifically for the Connexions project, this specification is described in detail in the [software](#) section of the site. As is usual with XML specifications, the documentation does not make for light reading.

Here is where things get difficult for the reader. Clicking on the "Create New Item" link is simple enough, and after approving a Creative Commons license for your work, you are taken to a "Language Selection" form that requires approval of CNXML as the base language of the module. You are then taken to a form, titled "Edit

Metadata," where you define your module's title, keywords, and description. Click "save" and the form vanishes and then reappears, unchanged. It may take a moment to see the tabs at the top of the "Edit Metadata" screen; to actually create the module, you must navigate through these tabs.

The leftmost tab, "Files," lists the files composing the module. This will include the CNXML file along with any images and support files. It is to this tab that writers are taken when they click on the name of an existing module. The writer may define other writers by filling out the "Roles" tab, preview the module with the "Preview" tab, and commit it to publication with the "Publish" tab. Click "Preview" and the page displayed will look very much like the Circle of Fifths module viewed earlier (without the content about music, of course).

To create content, then, the writer returns to the "Files" tab and clicks on the name of the CNXML file. This opens a window in which the CNXML file may be viewed directly. It also allows writers to import CNXML files they have created elsewhere and to export the CNXML file created here. What readers will not find is any means of editing the CNXML file except by editing the XML text directly—a task that is daunting even to experienced XML authors and impossible for someone without this experience.

In fact, Connexions expects authors to author their CNXML file elsewhere (they recommend Altova's [XMLSpy/Authentic](#) editor). Once the file has been edited elsewhere, it may be imported and viewed in the preview utility. There is no way to create content directly using Connexions.

Those readers who have explored beyond the tour provided in this article will find themselves even more confused. Browsing other authors' modules, they will no doubt have noticed the "Edit" link in the left-hand column (accessible, of course, only to module authors). And they will have read documentation describing an "[Edit In Place](#)" editor (the site authors even provide screenshots). However, this editor will be utterly impossible to discover for a new writer. The reason: It is not available until the content has already been published.

Despite the rich and sophisticated course and module management and creation environment, authors cannot create content without the use of an external XML editor, a task that typically requires not only a software purchase but also a certain amount of commitment to learning this new tool. Here the Connexions Web site becomes very different from blogging and seems to resemble more a proprietary course management system, no real improvement over any of the other tools that have been used to create the thousands of objects in academic repositories. And indeed, the reader, who may have been wondering why Connexions (as of this writing) boasts of only 2,425 modules, will have found the reason.

At this point the writer may be wondering what else is missing. And though there is a lot of content, background, and support on the site, there does not appear to be any means of exporting content beyond the manual "export" option in the editor. Certainly there is nothing resembling an RSS feed or an Open Archives repository. If students want to read the content, they must go directly to the Connexions Web site. Even if the XML files are stored elsewhere, there appear to be no XSLT transformations that would make them easily viewable by Web browsers (on Connexions, though content is stored in XML, it is processed by the server and displayed as HTML).

Make no mistake about it, Connexions is an impressive project. It provides many of the features that could make the production and distribution of learning objects possible on a much larger scale than exists today. And to be fair, Connexions remains a project under development; some of the problems outlined above may be addressed in future releases. But some won't—the requirement that a commercial product be used to create content appears to be a policy decision, for example.

There is no doubt that a project like Connexions, if it were opened up a bit, would address a need, providing what amounts to a Blogger of learning objects. It is not clear yet that Connexions will address that need.

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