Sharing Knowledge and Building Communities

Sharing Knowledge and Building Communities

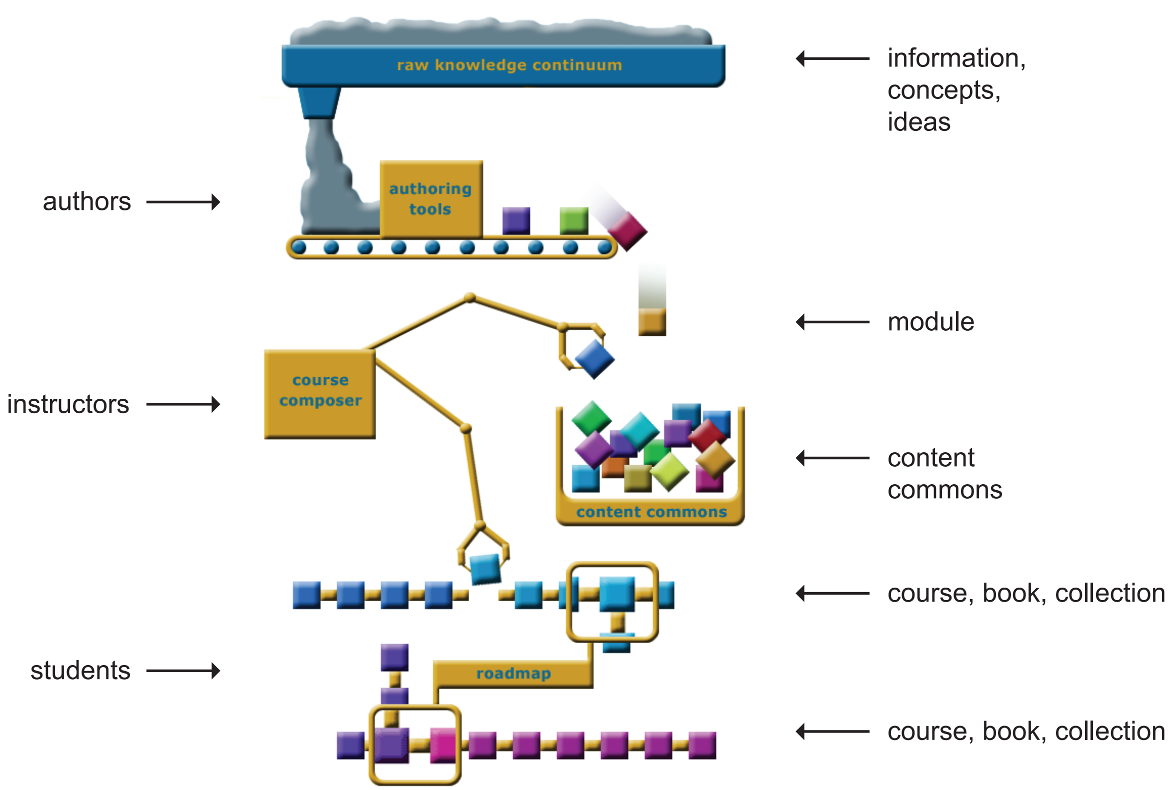
Knowledge is a dynamic continuum stretching across disciplines and constantly redefining educational boundaries. Recent technological advancements make it possible to develop and deliver quality, up-to-date educational materials that acknowledge this flow of interrelated concepts. With a community-driven, collaborative approach to creating and refining knowledge, education can be considered from new perspectives that ignite in students a love for learning.

What is Connexions?

Connexions is an open source/open content educational project that offers a fresh alternative to current modes of developing and sharing knowledge. In combination with powerful software tools, Connexions gives worldwide learners of any age free access to educational materials that can be readily explored and manipulated to suit individual learning styles. The free software tools also foster the development, manipulation, and continuous refinement of educational material by diverse communities of authors and teachers.

Connexions has been under development at Rice University since 1999 and is attracting the attention of a growing number of educators worldwide. Its hallmarks include:

- A *content commons* of diverse educational materials that span the knowledge continuum, are modularized for easy reuse, and are available free-of-charge to anyone in the world;
- Visualization and navigation of the "connexions" among concepts, courses, and curricula;
- High-quality materials, thanks to an iterative development process and an inherent quality assessment mechanism;
- Rapid, collaborative authoring of the materials by global communities of authors;
- Flexible, dynamic construction of customized courses and curricula, enabled by a coherent format (XML) and delivered in a variety of forms, from Web pages to e-books to paper texts;
- Separation of content and presentation for flexible customization of look and feel; and
- Content MathML for interfacing with advanced mathematical software packages.



cnx.org

Connexions is collaborating with Creative Commons (*creativecommons.org*) to develop its open-content licenses.

Visit the Connexions website at *cnx.org*

Connexions Software Tools

The Connexions architecture and software tools have been designed to support the development, management, and exploitation of the Content Commons. In a nutshell, the Connexions tools can be introduced using the "factory" analogy in the figure on the opposite page.

A global community of authors continuously converts "raw knowledge" from the continuum into small, self-contained modules of information, the equivalent of a page or two in a textbook. Modules can be imagined as special Web pages with hyperlinks pointing to prerequisites, applications, and supplementary material. Modules are placed in a database repository (the Content Commons) to be used, reused, updated, and adapted. Instructors use a Collection Composer software tool to weave modules into customized collections that can be placed on the web, presented in class, or printed as a paper text. Students and other learners access web collections or the repository directly using special visualization and navigational tools designed to highlight the non-linear "connexions" among concepts both within the same course and across courses and disciplines.

All software tools are free and open source licensed. The result is a coherent system for course development, organization, and delivery that mutually benefits students, instructors, and authors.

Connexions Content Projects

In Connexions, content is developed collaboratively by a community of authors under an open content license. All materials in the Content Commons are thus freely available to worldwide communities of authors who can collaboratively create, expand, revise, and maintain them.

This system has a number of advantages: it is cost effective and time efficient, lowers the barrier to entry into the author community and thus fosters diversity of opinion and subject matter, and increases the quality of the resulting materials.

As of May, 2009, the Connexions Content Commons contains more than 10,500 modules and 500 collections. These support one-third of the core undergraduate courses in the Rice Department of Electrical and Computer Engineering (ECE); Rice courses in computer science, bioinformatics, and mathematics; an ECE course at the University of Illinois at Urbana-Champaign; an ECE course at Ohio State University; two ECE courses at Cambridge University; music appreciation, music theory, and botany. Additional contributions have come from Georgia Tech and Polytechnic University. New material is being developed in emerging areas such as nanotechnology, history, and anthropology.

Connexions' major support has come from Rice University, the William and Flora Hewlett Foundation, the Maxfield Foundation, and the National Science Foundation. Connexions has also received support from National Instruments, Open Society Institute, the Hewlett Packard Corporation, Texas Instruments, the Vietnam Education Foundation, and the Class Foundation.

To get involved with Connexions, see the Web site or email cnx@rice.edu

cnx.org