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# Sloan-C View

## Perspectives in Quality Online Education

A Publication of the Sloan Consortium





# Connexions: Sharing Knowledge and Building Communities

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Connexions, a web-based teaching and learning environment, aims to change the way we develop and use course materials. Connexions is based on a set of intuitions that are shared by a remarkably wide range of academics: that knowledge should be free and open to use and re-use; that collaboration should be easier, not harder; that people should get credit and kudos for contributing to research and education; and that concepts and ideas are linked in unusual and surprising ways.

For authors and instructors worldwide, Connexions combines free authoring, course building, and publishing tools with an open-access content repository (see cnx.rice.edu). For students, it provides modular, interactive courses that are freely accessible. In Connexions, an author can create "modules" of information—smallish documents intended to communicate a concept, a procedure, a set of questions. String some modules together, and you have a web course or textbook, or weave a curriculum entirely of your choosing. Connexions directly challenges the current notion of a "textbook" by exploding it and asking different people to create its parts in a semi-structured but re-configurable manner, rather than having a single Maestro do it all and take all the credit. All Connexions content is open-licensed using the Creative Commons attribution license; all Connexions tools are free and open-source.

Connexions is being used in traditional college and K–12 settings, in distance learning, and by lifelong learners around the globe. Demand is surging; in May 2005 alone, the Connexions servers handled over 11 million hits representing 900,000 page views from 350,000 users from 157 countries. Volunteers are translating modules and courses into a range of different languages, including Spanish, Japanese, Chinese, and Thai.

Connexions content development is grass-roots organized and inter-institutional. Our most active content development areas at present include music, engineering, physics, chemistry, bioinformatics, nanotechnology, and history. For example, a vibrant community of electrical engineering faculty from Stanford, UC-Berkeley, University of Illinois , Michigan , Wisconsin , Ohio State , Georgia Tech, Rice, Cambridge , and TU Norway is developing a customizable digital signal processing (DSP) curriculum in Connexions. Austin, Texas-based National Instruments is contributing DSP training materials as well as developing a free "player" version of its popular LabVIEW signal processing tool that will make the materials come alive with sights and sounds, adding much needed interactivity to engineering curricula. Cambridge University Press is contributing a number of DSP textbooks to Connexions for free access.

Continued on page 8

# … From the Editors

**A letter from the editors of the *Sloan-C View***

*Too often we fail to recognize and pay tribute to the creative spirit.*
~ Alfred P. Sloan

## This issue recognizes the creativity of open source projects that are building communities for sharing innovation and resources.

Asynchronous learning networks have made open education resources (OER) more freely accessible, including "learning resources (courseware, content modules, learning objects, learner support and assessment tools, online learning communities); resources to support teachers (tools for teachers and support materials to enable them to create, adapt and use OER; as well as training materials for teachers; and other teaching tools), and resources to assure the quality of education and educational practices" [1].

This issue of the *Sloan-C View* introduces 3 open education resources, each of which considers users as co-developers:

- Connexions is a unique web-based teaching and learning environment. For authors and instructors, Connexions combines free authoring, course building, and publishing tools with an open-access content repository.
- The Open Learning Initiative (OLI) develops high quality openly available online courses through use-driven design that is grounded in cognitive theory, formative evaluation for students and faculty, and iterative course improvement based on empirical evidence.
- The National Repository of Online Courses (NROC) project supports the development and distribution of high-quality online courses to a worldwide audience .

• In "Hot off the Blog," Ray Schroeder looks at open source initiatives.

• A short list of open courseware, syllabuses and modules provides descriptions from the project websites.

• In Sloan-C member news, congratulations to the University of Central Florida and Virginia Tech for receiving 2005 Educause Teaching & Learning Awards.

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*The purpose of the Sloan Consortium (Sloan-C) is to help learning organizations continually improve the quality, scale, and breadth of their online programs according to their own distinctive missions, so that education will become a part of everyday life, accessible and affordable for anyone, anywhere, at any time, in a wide variety of disciplines.*

*You are welcome to join Sloan-C: http://www.sloan-c.org*

The Sloan-C workshop on Identifying Successful Business Strategies for Online Learning is an opportunity to learn and to network with colleagues worldwide. Follow the links below for information about the Sloan-C Fall 2005 workshops:

| | |
|---|---|
| Sept 14 – Oct 28 | **Identifying Successful Business Strategies for Online Learning** |
| Sept 21 – 30 | **Copyright Compliance for Online Educators** |
| Oct 5 – 14 | **Using the Quality Matters Rubric to Improve Your Online Course** |
| Oct 19 – 28 | **Transformative Curriculum Development and Assessment Practices for Online Educators** |

Sign up here to be notified of new events, and for more information, and to register, visit Sloan-C Online Events.

• It's time to plan your attendance at the 11th ALN Conference: The Power of Online Learning: Mobilizing to Expand Community, in Orlando , Florida , November 17–19, 2005 . Remember, premium members receive discounts on conference attendance.

For a wealth of useful information, please visit the Sloan-C free resources page. And, to contribute in kind, please share your effective practices with the higher education online community in the Sloan-C effective practices collection.

We look forward to hearing from you and to seeing you online,

… for the Sloan Consortium
Frank Mayadas, John Bourne and Janet Moore

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[1] WCET 2004 Activity Report: http://wcet.info/about/ar/2004/activity/index.asp.

# The National Repository of Online Courses: A Sustainable Model for Collaborative Development, Access, & Interoperability of High-Quality Online Courses

**Ruth Rominger**, *Director of Learning Design*
*Monterey Institute for Technology and Education*
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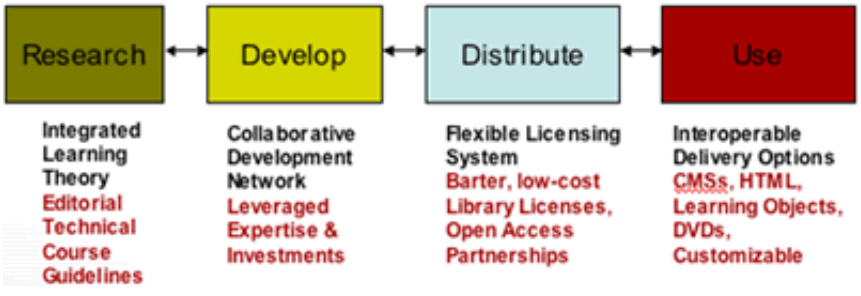
The **Monterey Institute for Technology and Education**, an educational non-profit organization committed to improving access to education has recently launched the National Repository of Online Courses (NROC) project. NROC supports the development and distribution of high-quality online courses to a *worldwide audience*. The goal of NROC is to facilitate collaboration among a community of developers to create a library of online courses that are available to everyone. Supported by The William and Flora Hewlett Foundation, the library launched this summer offering courses for high school, Advanced Placement©, and higher education.

**A Sustainable Business Model.** NROC is being built upon an innovative business model that is prototyping a complete online learning value chain. The model consists of pedagogical and technical guidelines for course development, a collaborative development model, flexible delivery, barter, and licensing options, integrated to improve the quality of learning, leverage resources, and open up access to online education.

**Sustainable Online Course Value Chain**




Continued on page 4

openlearninginitiative

The Open Learning Initiative (OLI) is devoted to developing high quality openly available online courses through use-driven design that is grounded in cognitive theory, formative evaluation for students and faculty, and iterative course improvement based on empirical evidence.

OLI started in the fall of 2002, funded by a grant from The William and Flora Hewlett Foundation. The Foundation's goal of using information technology to help equalize the distribution of knowledge and educational opportunities for individuals, faculty, and institutions within the United States and throughout the world, is in concert with the research and teaching interests of the OLI faculty at Carnegie Mellon. While OLI makes its courses openly and freely available on the web as part of The Foundation's Open Content initiative, OLI distinguishes itself from many other OpenCourseWare (OCW) projects in the amount of instruction OLI embeds in its online courses. Many OCW course materials would require a significant amount of additional instructional material and instruction to support a novice self-learner. OLI's goal is to embed in the course offering all of the instruction and instructional material that an individual novice learner needs to learn a topic at the introductory college level. If used in mixed-mode with traditional instruction, OLI courses become particularly effective. OLI provides feedback tools that give instructors insight into where their students are mastering the concepts and skills and where their students are struggling so that instructors can use their teaching time with students most effectively.

The Open Learning Initiative has a dual focus of product development, in the form of producing online courses, and research, in the form of investigating how to make such courses increasingly effective in facilitating learning. Each of the OLI courses are designed to address learning challenges specific to the domain area of the course. One example is the unit on stoichiometry in the OLI chemistry course. College level chemistry is often taught out of context as a set of abstract mathematical skills.

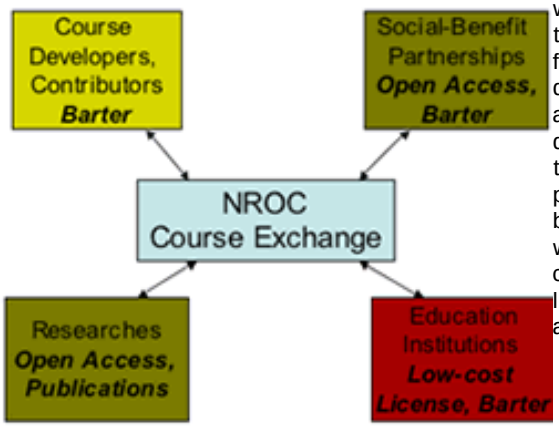
Continued on page 4

## NROC, continued from page 3

**Collaborative Development.** As the online education field takes off, tens of millions of dollars are being spent on developing thousands of courses at the instructor and class level. Yet, when we survey the courses in use and in development, a tiny percentage employ innovative learning theory, high production value, or interoperable technical specifications. Within this landscape, NROC has built a model that allows course developers to share guidelines and expertise, advise on design and implementation, seek joint funding for collaborative development, and match-make institutions with the same needs to leverage existing resources into shared curriculum development.

**Collaborative Developer Network**

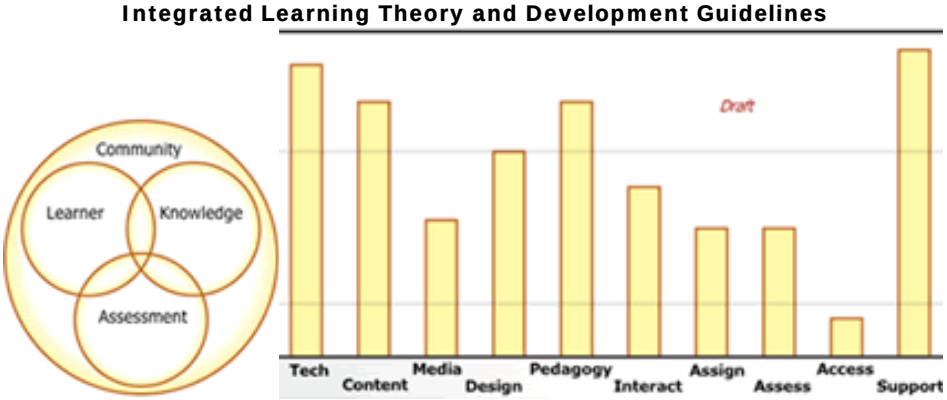

**Flexible Barter and Licensing Model**




**Global Distribution.** NROC partners with academic institutions, publishers, teaching organizations, state and federal agencies, international distributors, social benefit programs and others to create a global distribution network to provide courses to student, teacher, and the general public at little or no cost. Courses may be licensed for use in a variety of ways, including barter (trading for contributing resources to the library), low-cost library licenses, and open access licenses.

**Development Guidelines.** NROC guidelines provide a comprehensive framework and set of principles that synthesize what is known about effective online education. The guidelines were written to evolve as the marketplace of technologies, collaboration, investment, and learner and teacher experiences shift. They are designed to help bridge the gap between what research tells us about learning, the current state of the online learning marketplace, and the existing technologies. The long-term goal of National Repository of Online Courses is to create a robust digital library of online course content. A short-term goal is to disseminate the NROC guidelines to facilitate collaboration in the course development community.

**Pedagogy and Content**
**Integrated Learning Theory and Development Guidelines**




**Design and Technology**

**Interoperability.** NROC technical guidelines and development provide for as much interoperability as is reasonably possible in the current digital environment. The NROC team (re)develops courses and learning objects to fit into a flexible schema that keeps file hierarchies, content, activities and assessments organized for porting into the most commonly used CMS tools. To support a wide variety of delivery options, NROC provides resources, training and consulting services to aid course library implementation.

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## OLI, continued from page 3

The traditional approach encourages students to employ learning strategies that enable them to perform well on traditional chemistry exams but does not support students to learn the relationship between the mathematical procedures and the chemical phenomena those procedures represent. Nor do most traditional approaches emphasize the relationship between chemical concepts and the real world. The OLI chemistry course is designed to address both of these educational challenges. The course connects mathematical procedures to real chemistry by supplementing traditional problems with activities in which students design and carry out their own experiments in our online virtual chemistry lab. The OLI unit on stoichiometry connects the chemical representations and calculations to the real world by situating the learning of stoichiometry in the real world problem of arsenic contamination of the water supply in Bangladesh . We are currently evaluating the effectiveness of our approach by studying how students use the course and the impact of their use on learning outcomes. As with all OLI courses, we will use the results of the study to inform the next iteration of the course and to inform future course designs.

OLI combines the research base from cognitive and educational psychology with content expertise from university professors and a process of use-driven design to develop courses. We believe this approach is essential to our finally achieving the long-held promise of using technology to transform both the quality of and access to post-secondary education.

For more information about OLI and to access the open and free versions of our courses, please visit our website at www.cmu.edu/oli.

# Identifying Successful Business Strategies for Online Programs

*September 14th-October 28th*

This is a **can't miss** workshop for top level administrators!

Learn from business models and the latest research from Sloan-C on identifying strategies that will help make your online program a success!

Members: $595
Free Sloan-C Members:$535.50
Premium Sloan-C Members: $297.50

*www.sloan-c.org for more information.*

Starting September 14, join Sloan-C for an informative workshop sharing research and exploring best practices in the business strategies and models used by colleges and universities offering online learning. The workshop is intended to share with participants what we know thus far about how universities started their online efforts, what business strategies and functions seem most critical to success and what models for non-profits seem most prominent.

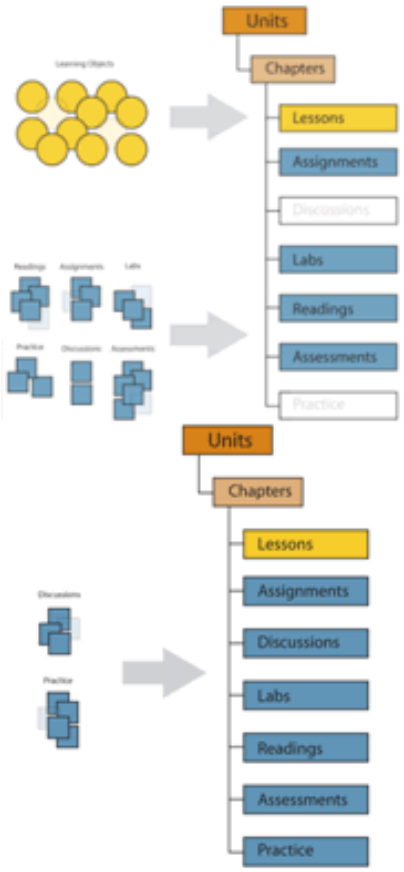
**Organizational Roots**
Three principles heavily influenced the adoption of online learning—cost, quality and access. The early launch by colleges and universities into online learning was often predicated on the institution's mission and existing organizational structure. Institutions with a history of continuing education frequently organized distance learning as an independent unit. These units were often required to operate financially as "for-profits" in a not-for-profit context. Recovering costs and increasing access were top priorities for these units. Other institutions grew their online learning efforts within academic colleges or internal service units. Academic units often concentrated on increasing access and quality for students while usually neglecting cost recovery or cost efficiencies. Many of these providers were premier in their discipline area. Institutions with distance learning organized in internal service units were also trying to balance the three principles of cost, quality and access but worked within the mainstream to integrate online learning as an access option for any program. These units had very different resources and constraints than online learning units organized in academic colleges or continuing education units.

**Differences Across Functions**
Exploratory survey findings indicated three primary types of organizations among the majority of respondents: self-funded independent units, self-funded units within a college, and units that are centrally/over-head funded. Many respondents were combinations of the three primary models. There were marked differences between the models in the level of control reported over the various functions related to online learning. These functions included business decision making such entering partnerships or removing products from the market; student services; quality assurance; curriculum development and the ability to hire instructors. The differences in functional control highlight the different contexts in which online learning leaders manage the three principles of cost, access and quality. The differences

NROC, Continued from page 4

**Customization.** To address some of the cultural and technical barriers to instructors and institutions adopting courses from other organizations, NROC has designed courses and processes for customization in common course management systems. NROC content and technical guidelines deliver a fairly uniform organization of course learning objects so that instructors, or development partners can modify the courses by hiding unwanted files and augmenting with new content.

**Interoperable Delivery Options and Customization**




For more information, visit *montereyinstitute.org*; and for review copies of the NROC guidelines, contact rrominger@montereyinstitute.org.

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across functions also illustrate the challenge of identifying and using best practices and benchmarks.

Identifying Successful Business Strategies for Online Learning will help participants answer these questions: How do you identify your context? How can you identify your peer organizations? How can you identify best practices that will work best for your organization?

## Open Courseware, Syllabuses and Modules (excerpts from websites)

The Croquet Project A combination of computer software and network architecture that supports deep collaboration and resource sharing among large numbers of users within the context of a large-scale distributed information system. Along with its ability to deliver compelling 3D visualization and simulations, the Croquet system's components are designed with a focus on enabling massively multi-user peer-to-peer collaboration and communication.

Johns Hopkins University School of Public Health The Johns Hopkins Bloomberg School of Public Health's OpenCourseWare (OCW) project provides access to content of the School's most popular courses.

LON_CAPA Open Source Freeware Distributed Learning Content Management and Assessment System: Sharing and using online learning and assessment materials across institutions and disciplines.

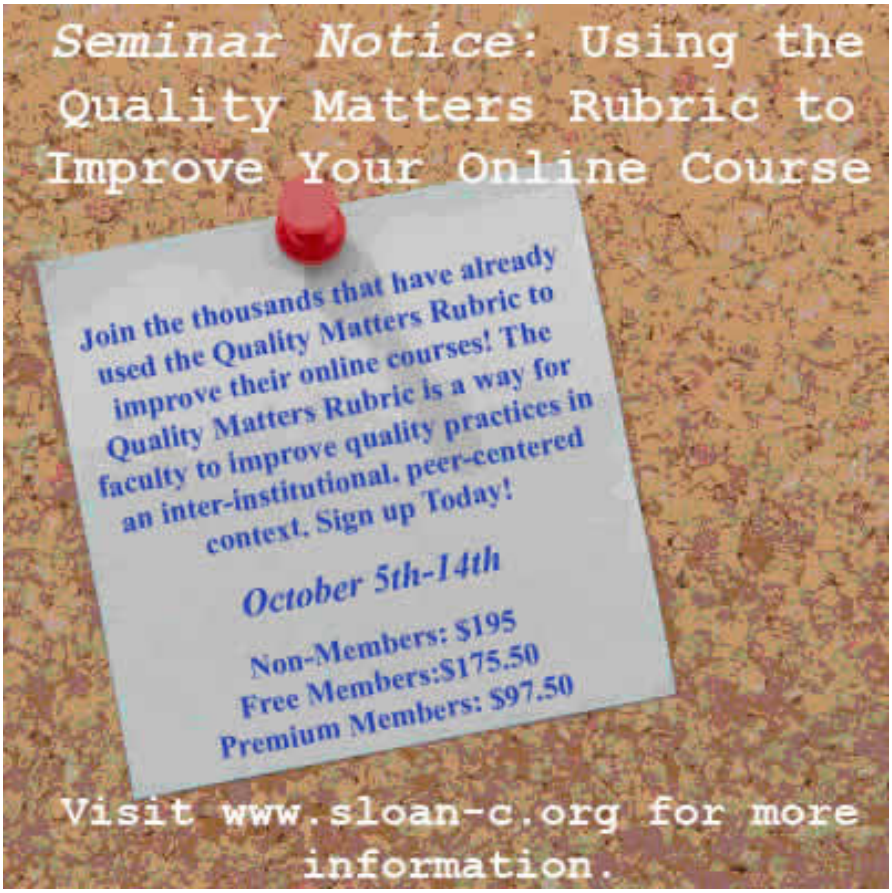
Massachusetts Institute of Technology A free and open educational resource for faculty, students, and self-learners around the world. OCW supports MIT's mission to advance knowledge and education, and serve the world in the 21st century. It is true to MIT's values of excellence, innovation, and leadership.

Mambo A full-featured content management system that can be used for everything from simple websites to complex corporate applications. Continue reading for a detailed feature list.

Merlot A free and open resource designed primarily for faculty and students of higher education. Links to online learning materials are collected here along with annotations such as peer reviews and assignments.

continued on **page 7**

According to wikipedia, itself an open source project, ***open source*** means "that the origins of a product are publicly accessible in part or in whole. One of the most prominent examples of open source is from the software industry. When software is open source, its source code, documentation and other content are publicly accessible by an acquirement of an open-source license, or it is publicly accessible on an open-source basis. Software developers publish their software as open source, so anybody may also develop the same software or understand how it works. Open-source software generally allows anybody to make a new version of the software, port it to new operating systems and processor architectures, share it with others or market it. The advantage of open source is to let the product be more understandable, modifiable, duplicatable, or simply accessible."




## *2005 Educause Awards 2 Sloan-C Schools for Systemic Progress in Teaching and Learning*

The Educause award program "recognizes transformative improvements in the campus teaching and learning culture. It honors replicable, sustainable, technology-based programs and practices that have helped move institutions or systems toward effective, enterprise-wide, learner-centered instructional systems."

- University of Central Florida
- Virginia Tech

*"Innovation drives the information economy. It is the basis of individual empowerment and control. Putting a lock on innovation has dramatically harmed individuals, economies, and society in many ways."*
*The Croquet Project*

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### Open Source Resources, continued from page 6

Moodle A course management system (CMS), a free, Open Source software package designed using sound pedagogical principles, to help educators create effective online learning communities.

The Sakai Project A community source software development effort to design, build and deploy a new Collaboration and Learning Environment (CLE) for higher education.

SOFIA (Sharing of free intellectual assets) Encourages the free exchange of *community college-level* materials on the World Wide Web. It is our hope that Sofia will lead to the exploration of ways of supporting instruction and student learning using web-based resources.

Tufts University Tufts OpenCourseWare (OCW) seeks to capitalize on the potential of the internet to eliminate borders and geographic distance as obstacles to the instantaneous exchange of knowledge and new ideas. Unlike distance learning programs that charge tuition, provide formal instruction and limit participation, OpenCourseWare offers all course materials free to everyone with online access. Educators from around the world may upgrade their classes; students may enhance their coursework or pursue self study; the general public may glimpse the depth and breadth of what leading universities are offering and benefit from reading lists and lectures.

Utah State University USU OCW is a free and open educational resource for faculty, students, and self-learners throughout Utah and around the world. OCW supports USU's mission to serve the public through learning, discovery, and engagement.

## Hot Off the Blog

by Ray Schroeder

**This month we are looking at a variety of open source initiatives in online learning that are changing the way in which we develop, share and collaborate.**

**Values of Community Source Development — Lois Brooks, Syllabus** — To help us understand open source in the context of higher education, Lois Brooks lays a groundwork based on the work of some of the best thinkers in the software development world. There are a lot of projects underway in higher education institutions right now that are pushing software into open source. Open source isn't new, of course, and in the 30 years that it has been a viable model for software development, some common practices and values have emerged. The structure and beliefs of the open source community are increasingly present in higher education. In recent years a trend toward community-based projects has emerged, where institutions pool their talent and resources to develop products for use by the education community.

**Really Open Source — Scott Jaschik, Inside Higher Ed** — Few projects in academe have attracted the attention and praise in recent years of OpenCourseWare, a program in which the Massachusetts Institute of Technology is making all of its course materials available online— free—for anyone to use. In the four years since MIT launched the effort, use of the courseware has skyrocketed, and several other universities have created similar programs, assembling material from their own courses. With less fanfare than MIT, Rice University has also been promoting a model for free, shared information that could be used by faculty members and students anywhere in the world. But the Rice program— Connexions—is different in key respects. It is assembling material from professors (and high school teachers) from anywhere, it is offering free software tools in addition to course materials, and it is trying to reshape the way academe uses both peer review and publishing. The project also has hopes of becoming a major curricular tool at community colleges.

**MERLOT: A Model for User Involvement in Digital Library Design and Implementation — Flora McMartin, Journal of Digital Information** — The task of finding online learning materials can be a hugely time-consuming activity. The search alone is arduous, but when added to the need for intensive instructor review of those materials, and that once identified they must also learn how to use the materials effectively for teaching, the task becomes formidable. It is no wonder that the hurdles to the effective use of online learning materials are many (CSHE 2004, Gibbs et al. 2004). Whether the classroom is real or virtual, faculty and instructors seek materials that support their teaching efforts, their pedagogy and student learning goals. MERLOT's services and features are designed to help faculty and instructors overcome the hurdles associated with finding good materials (e.g. lack of time, lack of organization, overwhelming numbers of unrated materials) through the integration of peer-reviewed online materials with effective teaching practices.

You can always see the latest items, and find many more articles posted seven days a week at the **Online Learning Update blog**. Until next time, I'll see you online! ~ray

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### Connexions, continued from cover

In other content projects, the *University of California-Merced* is developing their Introduction to Biology and College Algebra courses in Connexions. The *National Council of Professors of Educational Administration* (NCPEA) is developing a Connexions knowledge base in school leadership and administration. They are also developing a community-based peer review process to identify and direct readers to high-quality materials.

Connexions is open to contributions from anyone worldwide. To learn more or to get involved as an author or instructor, visit cnx.rice.edu.

The Sloan Consortium
A Consortium of Institiutions and OrganizationsCommited to Quality Online Education

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Janet C. Moore, Editor
Kathryn M. Fife, Publisher


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**If you know of, or are hosting, an event that should be listed on the Sloan-C View Calendar, please send the details of the event and url to publisher@sloan-c.org.**

## ONLINE EDUCA BERLIN 2005

Date: November 30-December 2, 2005
Location: Berlin, Germany
URL: http://www.online-educa.com

Meeting the needs of the international e-learning and distance education industry, the annual Online Educa Berlin conference is a net-working venue for strategists and practitioners from all over the world.

## CALENDAR

**Please see page 2 for a list of upcoming Sloan-C Workshops and Seminars that will be offered online this Fall.**

### ALT-C 2005: Exploring the Frontiers of E-learning

Date: September 6-8, 2005
Location: Manchester, England
URL: http://www.alt.ac.uk/altc2005/index.html. Please see the website for more detailed information.

### WCET's 17th Annual Conference E-Learning E-Llusions Triumphs: Re-imagining the Academic Ecosystem

Date: November 2-5, 2005
**Location:** Astor Crowne Plaza Hotel, New Orleans, LA
**URL:** http://conference.wcet.info/2005/

In response to the increasing demands on higher education, institutions are finding creative ways to use e-Learning and other technology-supported services. Can some of the best practices from institutions around the world inspire a new image for higher education in a global economy? Can we develop a cohesive vision for a new academic ecosystem that incorporates what we have discovered about e-learning, both from our past errors and "e-llusions" and our current successes in policy, pedagogy, and services? WCET's 17th annual conference will address just these issues. The program features more than 200 speakers covering the latest trends and most innovative thinking in e-learning policies, practices, and services across six topic strands: Beyond the Institution, Emerging Technologies, Faculty Focus, Institutional Level, International, and Student Focus. Join us…and re-imagine the academic ecosystem!

### Sloan-C International Conference

Date: November 17-19, 2005
Location: Rosen Centre, Orlando, FL
URL: http://www.sloan-c.org/info/09/valnconf.asp

Come celebrate the 11th year of our conference with us. This conference, which will provide the latest information on asynchronous learning programs, processes, packages, and protocols, is geared to both experienced professionals and interested newcomers to online learning who hail from a variety of work sectors, including higher education, continuing education, business, government, health care, professional associations, and nonprofit organizations.