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# Open educational resources in higher education

## A guide to online resources

Just over a decade old, the open educational resources movement has garnered considerable attention recently with increased attention of the accessibility and cost of education. Open educational resources are digital learning objects that are “offered freely and openly for educators, students, and self-learners to use and re-use for teaching, learning, and research.”<sup>1</sup>

The movement originated in the late 1990s with the first major initiative coming from the Massachusetts Institute of Technology (MIT). In 2002, MIT released 50 freely available courses through the OpenCourseWare initiative. One year later, MIT officially opened OpenCourseWare with 500 classes.<sup>2</sup>

In 2007, the Open Society Institute and the Shuttleworth Foundation gathered parties interested in the open educational resource movement in Cape Town to offer a venue to collaborate on formalizing this movement. From this gathering, the Cape Town Open Education Declaration was drafted.

This document discusses the need for educators to openly share their resources and make them freely available for others to use.<sup>3</sup> The open educational resources movement continues to gain attention with an announcement from MIT who recently unveiled their MITx program, which will begin to grant certificates for students who complete a defined number of open courses through the institution.<sup>4</sup> The Internet resources listed here comprise a sampling of content focused primarily at the college and

university level. Many institutions offer open educational resources online through their own Web sites, and, for the most part, we have chosen not to review these institution-specific resources, except where they have made significant broader contributions.

### Full-package courses

- **Connexions.** Launched in 1999 by Rice University, Connexions offers users the ability not only to create content but to repurpose others’ content to include in a course. Currently Connexions includes more than 17,000 learning objects in a range of disciplines. The benefit of Connexions is the ability of an instructor to pull from a range of learning objects and organize the material to create his or her own course. Connexions offers textbooks, journal articles, learning objects, and assignments. Once organized, the material can be viewed as either a PDF or EPUBS document for distribution to students. Access: <http://cnx.org/>.



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• **MIT OpenCourseWare.** A pioneering initiative in the open educational resources movement, MIT OpenCourseWare currently offers approximately 2,000 courses in a range of disciplines. These full courses can include lecture notes, online textbook material, assignments and exams with answers, and multimedia. The course content is downloadable, with the exception of the video materials, through iTunes. Like any open educational resource, these materials are freely available for educators to re-use with attribution. *Access:* <http://ocw.mit.edu/index.htm>.

• **MITx.** Building on the success of MIT OpenCourseWare, the Massachusetts Institute of Technology joined the Massively Open Online Course (MOOC) movement with the announcement of MITx. This initiative will make courses available to students attending MIT, and is open to anyone interested in taking a course. These courses will include recorded lectures, course material, and assessments, which can be organized in a student portfolio. After completing a determined sequence of courses, a student will be awarded a certificate indicating completion. The MOOC movement represents a recent progression of the open educational resources movement by now offering recognition of students' completed work. *Access:* <http://mitx.mit.edu/>.

• **Open Course Library (Washington State Board for Community and Technical Colleges).** In November 2011, the Washington State Board for Community and Technical Colleges released the first half of its Open Course Library, which aims to eventually offer all of the content for the highest-enrollment courses in the state system. The 42 courses that are currently available are designed to be used primarily by faculty, who can then integrate any or all elements of the syllabus, lessons, discussion topics, readings, and assignments they feel are appropriate. Some courses offer links to free outside readings and textbooks, others recommend textbooks that cost no more than \$30. Open

Course Library offers downloadable files in Common Cartridge and ANGEL, which are compatible with other course management systems. *Access:* <https://sites.google.com/a/sbctc.edu/opencourselibrary/>.

• **Saylor Foundation.** Founded by a corporate CEO, the Saylor Foundation offers complete, freely accessible packages for college-level courses in business, science, math, engineering, the humanities, and the social sciences. Courses are designed to be easily used by students who are working entirely on their own, outside of any formal educational system. Each course is made up of a syllabus, links to free online readings, multimedia resources and tutorials, assignments, and exams. Quantitative assessment is available for those who have set up an account. A student enrolled in a course must take a graded final exam, and scores and grades are recorded in the student's account. Qualitative assessment is trickier. For example, assessment of the final essay assignment for English Composition 1 is completed by the student reading his or her essay aloud to a friend and revising it based on feedback. Together, these courses comprise curricula, which include core, prerequisite, elective, and subfield courses. *Access:* <http://www.saylor.org/>.



## Video

• **Academic Earth.** This independent nonprofit collects videos from the lecture-halls of universities around the country. Watch a semester's worth of video lectures from a given university course, or find a curated collection of lectures from the archive on a particular theme. No other course materials are offered. While the Web site lists 30 partner institutions, several only provide informational videos or links to their online degree programs. But overall, hundreds of instructors' lectures are provided. *Access:* <http://academicearth.org/>.

• **Khan Academy.** A widely popular example of open educational resources, the Khan Academy began in 2004 as a way for the founder, Salman Khan, to begin creating short tutorials to teach his cousin and others mathematics. The tutorials were eventually posted to YouTube, and their success of these resulted in the creation of the Khan Academy. Currently the Khan Academy offers open educational resources primarily in mathematics and science but has expanded to include other subject areas. These 3,000 plus online videos are self paced and allow students to focus on the specific lessons they need help with. *Access:* <http://www.khanacademy.org/>.

## Repositories

• **Applied Math & Science Educational Repository.** Although *math* and *science* are in the title, this repository of online educational content offers resources in a variety of other disciplines, too, including vocational education and health. *Access:* <http://amser.org/>.

• **Merlot.** This massive resource was begun by a consortium of state higher education systems. Today it offers access to learning objects, full course curricula, open access journals, assessment tools, open textbooks, discipline-specific pedagogical resources, and more. Material is peer reviewed, and reviewer and user comments are accessible to all. Academic discipline is represented by communities, each with their own editorial board of faculty from disparate institutions. Browsing through users' "personal collections" can provide insight into how others use the materials. *Access:* <http://www.merlot.org/>.



• **OER Commons.** Compiling contributions of individuals, universities, cultural

institutions, and online initiatives, OER Commons allows educators to access open online content based on a useful, faceted search function. Outside links are displayed within an OER Commons frame, which makes navigation easier or more cumbersome, depending on your preferences. Registered users can save and comment on items. *Access:* <http://www.oercommons.org/>.

• **National Repository of Online Courses (NROC).** NROC offers a short list of advanced placement, college preparatory, and foundational college-level courses in math, science, and American history and government. A project of the Monterey Institute for Technology and Education, NROC offers full courses, lessons, and learning objects developed by membership institutions that follow lengthy pedagogical guidelines, and who are then able to share courses, use others', and integrate content into their own course management systems. *Access:* <http://www.montereyinstitute.org/nroc/nrocdemos.html>.

• **iTunesU.** Apple made a splash at the beginning of 2012 with the announcement of its iTunesU app. Although content is available through the regular iTunes site, the iTunesU app allows users to organize course lectures, notes, books, and other supporting materials for an entire course or combination of courses. Participating educational and cultural institutions number in the thousands and make varying degrees of content freely available—from one-off video or audio lectures to full blown courses complete with syllabi, lecture notes, iBook textbooks, quizzes, and more. Some content is simply an upload of a static film taken from the back of a traditional university lecture hall. Other content is created specifically for use in iTunesU. For instance, Open University has created a multitude of self-paced courses, including *Moons: An Introduction*, which suggests a self-directed pace of completing the course in a week. Many participating institutions provide more or different content on their own open-course

Web sites from what they offer in iTunesU. *Access:* <http://www.apple.com/education/itunes-u>.

## Textbooks

- **Flatworld Knowledge.** This for-profit publisher offers open access textbooks, primarily in business, but in other subjects, as well. The company's profit is made from selling supplemental materials and alternative book formats to students. *Access:* <http://www.flatworldknowledge.com/>.

- **Global Textbook Project.** An international initiative, Global Textbook Project seeks to provide access to free, quality textbooks to students in developing nations. The project is led by a team of university faculty members, whose global staff is creating a growing collection of open textbooks. *Access:* <http://globaltext.terry.uga.edu/>.

- **National Academies Press.** Most books published by the National Academies Press can be downloaded for free in PDF format. Just find the book you want, bypass the print price, and click the "Download Free PDF" button. This site requires that you provide a name and e-mail address. *Access:* <http://www.nap.edu/>.

- **Smarthistory.** This award-winning, multimedia, online art history textbook is now owned and operated by the Kahn Academy. *Access:* <http://smarthistory.khanacademy.org/>.

- **WikiBooks.** Offering more than 2,000 titles, WikiBooks offers access to open textbooks written collaboratively (much like Wikipedia entries). Peer reviewers are any users who wish to contribute. *Access:* [http://en.wikibooks.org/wiki/Main\\_Page](http://en.wikibooks.org/wiki/Main_Page).

## News and additional information

- **Open Courseware Consortium.** With a more global perspective, Open Courseware Consortium seeks to make an impact on accessibility to education on an international scale. Rather than a simple repository of

courseware, the Open Courseware Consortium offers its members the tools and resources to develop their own content. Click on "Community" to find the consortium's toolkit for those seeking to make a case for open educational resources at their own institutions and communities, as well as help with assessment, pedagogy, and more. Click "Courses" to search external content from the consortium's 19 sustaining members. *Access:* <http://www.ocwconsortium.org/>.

- **Open\*Education.** Opensource.com devotes a section of its site to news and insight from the world of open education resources. Contributors include librarians, college faculty members, and other open-source and open-access enthusiasts. Updates appear every few days. Opensource.com is a publication of Red Hat, a for-profit, open source technology developer. *Access:* <http://opensource.com/education>.



# why OPEN EDUCATION matters

- **Open Educational Resources Blog.** Written by Cable Green, director of global learning at Creative Commons, Open Educational Resources covers the international world of open educational resources. The blog offers the latest news on conferences, Webinars, and collaborative activities in the United States and around the world. *Access:* <http://blog.oer.sbctc.edu/>.

- **Why Open Education Matters.** This year, a star-studded panel of judges will spend part of their summer picking the best submissions for this online contest. A video introduction from Secretary of Education Arne Duncan invites contestants to submit short videos to be judged by the likes of Davis Guggenheim, James Franco, Nina Paley, and others. The contest is a collaborative project of Creative Commons, the U.S. Department of Education, and the Open Society Institute. Winners of the \$1,000, \$5,000, and \$25,000 cash prizes will be announced July 2012. *Access:* <http://whyopenedmatters.org/>. 