

# How Open is Open Education?

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A grassroots movement is sweeping through the education world, and it promises to change forever the way knowledge is created and shared. Whether this promise is realized, however, hinges on letting go of long-held beliefs about the ownership of intellectual materials and a collective re-commitment to learning.

The Open Education (OE) movement aims to address the high cost, limited access, static nature, and often low quality of the world's textbooks and learning materials. Open educational resources (OERs) are free for everyone at any time on the Web; moreover, they promise to be readily available at low-cost in print, adapted to many backgrounds and learning styles, interactive and immersive, translated into myriad languages, continually up-to-date and corrected, and never out-of-print.

There are two key enablers of the OE movement. The first is technology like the Internet, which enables virtually free digital content distribution; Web 2.0 tools like wikis and semantic tagging systems, which enable real-time distributed global collaboration; advanced visualization and graphics tools, which enable immersive simulation environments; and print-on-demand systems, which enable the production of inexpensive paper books for those who prefer or need them.

The second key enabler is open copyright licensing as provided by the Creative Commons (CC) and GNU Free Documentation licenses. These turn once closed and static educational materials into living objects that can be continuously developed, remixed, and maintained by a worldwide community of authors and editors.

A leading example of a large-scale OE project is Connexions (cnx.org), which was launched at Rice University in 1999 to challenge current modes of teaching and learning as well as how knowledge is developed and shared. Connexions links and supports worldwide communities of authors to collaboratively "create, rip, mix, and burn" free and open learning materials.

Connexions usage is global and growing, with approximately 1 million unique users per month to its web site accessing over 8000 smallish modules and 450 collections/textbooks at press time. Connexions also enables print-on-demand of all of its materials at a fraction of conventional commercial publisher prices (\$20 for a 300-page engineering textbook in regular use at Rice University; \$31.95 for a 612-page statistics textbook used at a number of US and Canadian community colleges).

While the excitement around OE is growing rapidly, there is also a growing confusion that threatens to splinter the movement and smother its impact.

A minor confusion is caused by the myriad of different content formats used to encode OERs: PDF, Microsoft Word, Flash, HTML, XML, ... Trying to mix together a new OER using elements of this extensive and mutually incompatible palette is a daunting task that is rarely undertaken today, rendering the materials' openness almost moot. Fortunately this confusion should be temporary as we develop more powerful format-to-format translators and as more OE projects adopt compatible technology standards (such as XML).

A much more significant and dangerous confusion surrounds open copyright licenses. Consider, for instance, that there is not one "CC license" but rather at least six main licenses of varying degrees of restrictiveness. Some restrictions are mild or have a positive community impact, such as the "Attribution" (CC-By) requirement that requires remixers to cite the originating author of an OER or the (so-called viral) "Share-Alike" requirement (CC-SA) that requires remixers to release their material under a similar license.

Other restrictions are much less mild. In particular, the "Non-Commercial" restriction (CC-NC) severely limits the distribution of OERs by putting it out of reach of commercial entities. Creators choosing a CC-NC license often say that they do so to protect themselves from potentially unfair commercial exploitation. However, a CC-NC license not only limits the spread of knowledge by complicating the production of paper books, e-books, and CD/DVD ROMs, but it also precludes improvement of the materials by commercial entities and cuts off potential future revenues that might sustain non-profit OE enterprises into the future. How is this "open"?

It is ironic that such an anti-commercial stance is nowhere to be seen in the open-source software world that provided the original inspiration for the OE movement. Would software like Linux, Apache, and Firefox have reached critical mass and global impact if they were not commercially useable? Now that Linux is a \$36B global business (2008) and over 50% of commercial

web servers run Apache, is there any question of their future sustainability? Of course not. The same cannot be said of OE projects using CC-NC licenses. (Connexions exclusively uses the CC-By license.)

Unfortunately, several factors drive OER creators and remixers toward the “lowest common denominator” of the most restrictive licenses. First, given a choice of licenses and limited educational material about them, it is well known that naïve users will choose the most restrictive license (see the distribution of CC licenses in Flickr, for example). Second, when combining content licensed using different licenses, the combination must be licensed using the most restrictive of the licenses. Perhaps a major campaign should be launched to educate OER creators on the many benefits and few risks of the more open CC-By and CC-By-SA licenses.

The open education movement promises to change the way the world develops, disseminates, and uses knowledge, resulting in a revolutionary advance in the standard of education at all levels. Along the way, it has the potential to completely reinvent the educational publishing industry, much in the way that the software and music industries have been reinvented thanks to the free digital distribution provided by the Internet. But this revolution can be sustained and accelerated only by emphasizing truly open platforms based on a common technology standard and truly open licenses.