Access to Knowledge as a Foundation for an Open World

By Carolina Rossini

The “open world” is an essential concept for the knowledge economy. It emerges from a world of pre-Internet political systems, but it has come to encompass an entire worldview based on the transformative potential of open, shared, and connected technological systems. The idea of an open world drives much of the social and political discourse around modern education and scientific endeavor and is at the core of the Open Access (OA) and Open Educational Resources (OER) movements. While the phrase “open society” comes from international relations, where it was developed to describe the transition from political oppression into a more democratic society, it is now being appropriated into a broader concept of an open world connected via technology—but this is a concept that is often at odds with traditional models of knowledge creation, distribution, and governance. The “open” movements in access and education are reactions to the potential afforded by the network, but are inspired by the sociopolitical concept of the open society.
In this sense, “openness is an attitude”—and it is one that was at the core of the original communities of the Internet and the World Wide Web—but as an attitude, it is a function of the user base and is “not necessarily something that organically arises from new technological systems.” Despite the best intentions and beliefs of many of the original thinkers of cyberspace, the last ten years have taught us that networked technologies can be made closed by changes in law, in markets, and/or in code. In peer-reviewed scholarly literature, for example, “open” was an alien concept as traditional publishers moved aggressively to control and restrict access during the first two decades of the web, marrying technical protection measures to radical price increases. There was a vision of technology as enabling control, not as enabling people as digital citizens. The “open world” is a natural metaphor to appropriate, then, for movements that oppose these digital land-grabs, since the idea of an open world resisting a dystopian control system moves naturally from political dictatorships in which information is controlled to a world of monopolistic control via industrial practice.

A key part of this digital enclosure movement is publishers’ appropriation of rights from authors. This transfer of power and property was a critical part of the analog “bargain”—a trade of copyright in return for a citation—but it has a much more drastic impact in the digital world, where the act of copying and distributing might well increase the visibility and impact of the author. The digital world is simply different from the analog world, and the technologies have outpaced the law. A related issue concerns works in the public domain. As noted in the Public Domain Manifesto (http://communia-project.eu/node/359), the Public Domain Charter (http://version1.europeana.eu/web/europeana-project/publications), and James Boyle’s 2008 book The Public Domain (http://www.thepublicdomain.org/), the digitalization of works in the public domain may end up meaning that those digitalized works will be privatized or protected by technology rights management (TRM) systems, even if the original analog versions are in the public domain. The control potential of the network, when married to business and control and has been, by any standard, quite successful, with commons-based tools now embedded not only in individual web materials but also as far “up” as the official website of the President of the United States.

Many of the open movements have arisen from the willingness to question proprietary systems of knowledge production and distribution, from the willingness to ask whether the old ways are appropriate to current society’s need for access to knowledge and for progress in science, education, and culture. One irony of the advance of the digital commons is that it, like elements of closed models, can draw its roots from analog habits (like the making of a mix tape) brought onto the web. Remixes and mashups are fundamentally human activities. And this is precisely what threatens the market incumbents. As they attempt to port closed analog models to networks, the networks undermine those models, but porting the sharing analog models to networks amplifies their power. Thus the analog concept of an open society can become a digital concept of an open world,
propagating through vertical content markets, government and citizen engagement, and cultural spheres.

This discussion is also of the first order of importance for developing countries. As Yochai Benkler has written, the change brought about in the networked information environment is deep and structural, in a way that has the potential to empower cultures left out of the Industrial Revolution. Thus, it is fundamental for us to understand, from a developing nations perspective, how the Internet changes the capacity of knowledge production, distribution, and access and how this affects access to knowledge, education, scientific innovation, and development, since “technological capacity, technological infrastructure, access to knowledge, and highly skilled human resources become critical sources of competitiveness in the new international division of labour.”

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Open Access
Open Access (OA) is a knowledge-distribution model by which scholarly, peer-reviewed journal articles are made freely available to anyone, anywhere over the Internet. In the era of print, open access was economically and physically impossible. Indeed, the lack of physical access and the lack of knowledge access were the same—if one did not have physical access to a well-stocked library, knowledge access was impossible. The Internet has changed all of that, and OA is a movement that recognizes the full potential of an open world metaphor for the network.

In OA, the old tradition of publishing for the sake of inquiry, knowledge, and peer acclaim and the new technology of the Internet have converged to make possible an unprecedented public good: “the world-wide electronic distribution of the peer-reviewed journal literature.” OA journals also are able to take advantage of the digital technologies more easily than are distribution models grounded in the analog world. OA journals cost less for users (in general, they are completely free to readers or are based on added-value service models) and grant the kind of reuse rights that most scientists associate with the web culture (the right to forward, e-mail, and print).

In some ways, OA journals are more willing to experiment with other aspects of publishing such as the decoupling of “validation” in peer review (“Is the research accurate?”) from the much more subjective and troublesome assessment of “probable impact” (“Is the research going to have an enormous impact in the next five years?”). Also, OA journals provide a faster validation of scientific results and a faster distribution of scientific results while ensuring the same quality factor as the traditional model, since online journals that follow the OA distribution model remain grounded in peer review.

OA is an important policy for developing countries. If implemented, OA can create the core conditions for knowledge transfer. In addition, OA is a strategic counterpoint against “brain drain,” since it provides broader and faster opportunities for scientists from any country to publish their work to the global audience without needing to permanently leave their home. For example, e-print and pre-print services like arXiv (http://arxiv.org/) and Nature Precedings (http://precedings.nature.com/) save months
of time compared to print journals and reach scientists unable to gain access to non-digital social networks (e.g., face-to-face conferences).

From a community perspective, OA also empowers the society at large, since it allows communities and institutions to manage the scientific information to which they have access, by allowing translation into local languages, aggregation of literature into “virtual journals,” integration between information and data, and text mining and navigation through the web, when licensed through open licenses such as those of Creative Commons. Additionally, OA naturally improves communication by encouraging open distribution, fostering partnerships, and strengthening scientific cooperation and collaborative approaches to problems that are common to developing countries, such as AIDS and neglected diseases. An example of this process is the PLoS Neglected Tropical Diseases journal (http://www.plos.org/cms/node/188); of the peer-reviewers, 40 percent are from developing countries.

In this sense OA, and its accompanying free software technologies such as the Open Journal Systems (http://pkp.sfu.ca/?q=ojs), can be considered more useful than closed models for developing countries, increasing technology and knowledge transfer. This is a new way of thinking about technology transfer—not as a gift of “free stuff” without cost, but as a philosophy of democratized digital knowledge governance. It is a way of thinking that has become possible only with the IT revolution, and it is one that is deeply affected by the idea of the open world.

**Open Educational Resources**

A significant attribute of most educational resources is that they are restricted to a set of traditional players with access through institutional enrollment or employment. Although in some countries, free provision of educational material is often provided through governmental programs, which guarantee access for those attending public schools, problems regarding the diversity, appropriateness, timeliness, and quality of these materials are common. This approach also ignores learners outside the traditional system, such as self-learners or those who simply cannot enroll in formal education. This situation is even more severe in developing countries, where, among other problems, teachers frequently need more and better training, resources are often scarce or nonexistent or simply bad, public library buildings are falling apart, and the cost of textbooks or complementary resources is prohibitive for many students and their families.

The philosophy of Open Educational
Resources (OER) conceives of educational materials as common public goods from which all should benefit, but most especially those who receive the least benefit and support from current systems of education, whether publicly or privately funded. This view is supported by the idea that knowledge itself is a collective social product, one that naturally forms a commons that needs to be accessible to all. The view is strongly aligned with the financial reality of educational funding, since the vast majority of educational materials are publicly funded in a diversity of ways, directly or indirectly, but the view is not aligned with the reality of the materials distribution, which is frequently non-public, closed, and tightly controlled. The question then becomes: once the public has paid for the resources (through taxes), how should those resources be managed and made available?

OER as a policy defined in the Cape Town Open Education Declaration (http://www.capetowndeclaration.org/) encourages and enables the open production of, sharing of, and access to educational content and resources, through a mix of policy, licensing, and collaborative production. This alone is a true societal good, increasing the value of investments made in education. But OER create the opportunity for a more fundamental and transformative change: a move from the passive consumption of educational resources to the formal engagement of educators and learners in the creative process of developing educational content. The learning process is in constant evolution through a deeper appropriation of the knowledge; a side benefit of the open world model is that it creates a transformation in the processes that create the knowledge products.

OER are teaching, learning, and research resources that reside in the public domain or have been released under an open intellectual property license that permits their free use or repurposing by others. In this sense, OER include learning content, software tools to develop, use, and distribute any kind of content, and implementation resources such as open licenses. They are a fundamental instrument to instantiate an open education framework and, as noted by the Cape Town Open Education Declaration, draw upon “open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues.” The open world for education may “also grow to include new approaches to assessment, accreditation and collaborative learning.” Examples of OER are the OpenCourseWare initiative (http://www.ocwconsortium.org), Connexions (http://www.cnx.org), the textbooks developed by CK-12 (http://www.ck12.org), the learning objects from the Teacher’s Portal in Brazil (http://portalprofessor.mec.gov.br/), Merlot (http://www.merlot.org) and Merlot-MAN (http://man.merlot.org), and OER Africa (http://www.oerafrica.org).

The motivations for the materialization of the OER phenomenon are many. George Siemens lists a number of reasons for educators to share learning resources for free: sharing digital resources has essentially a zero cost for dissemination, gives educators alternatives and increases competition in the market, and democratizes and preserves public education.

Studies point to multiple institutional rationales for OER projects: (1) they are a “good thing to do”; (2) public money should result in public goods; (3) they improve quality; (4) they build good public relations; (5) they aid cost recovery; (6) they lead to faster development; and (7) they counter the risk of doing nothing. For individuals, the rationales are familiar from other open
world projects: altruism, personal reputation, publicity, and the “cost of keeping it closed” on the Internet.

The OER community laid down three recommendations in the Cape Town Open Education Declaration:

- **Open education policy**: Governments, school boards, and colleges and universities should make taxpayer-funded educational resources open.
- **Open content licenses**: Educational resources should be freely shared through open licenses, which facilitate use, revision, translation, improvement, and sharing.
- **Collaborative production**: Educators and students should be able to participate in creating, using, adapting, and improving educational resources.

## Conclusions

The open world gains a much broader and empowered meaning over its original political context when it is restated as part of an individual’s right to participate within the knowledge society. The right to access to the Internet and the right to make and distribute content should not be held solely by business or by those in the wealthy societies of the moment. The rights to be a creator, to govern and develop one’s own knowledge, and to share with others are fundamental freedoms for the Internet age. And it is in this context that free and open-source software, OA, and OER appear and evolve, expressing modes of human interaction empowered by technology and permitted by an attitude toward—and, in many cases, a need for—freedom.

The voluntary, standard, open tools of the digital commons scale beautifully in areas where technologies and norms to create and publish are widely distributed—areas like blogging or photography. The more than 350 million digital objects posted online under Creative Commons licenses as of December 2009 demonstrate the power of the desire for freedom and of the individual user empowered by technology.\(^6\) The open world is a reaction to the power that every Internet user now has, and it is particularly important when we are dealing with knowledge outputs that were financed by public investment—outputs such as textbooks and articles about public health, not simply popular music. And this is where the open world is struggling hardest to flourish.

These infrastructures—the Internet and the commons—are not, however, enough to create freedom in the more complex knowledge spaces of science and education. One reason is that the knowledge products themselves are more complex, more expensive, more regulated. Another is that the incumbent
companies engaged in education and in scientific publishing have fought to prevent the emergence of even the most basic benefits of the open world. The tension between the potential of an open world and the reality of a closed world for science and education has now driven the explicit adoption of “open” as the core force of social movements advocating for a more democratic form of governance for publicly funded knowledge products. These movements have gained real success in the past decade.

But the open world has a ways yet to go before reaching its potential. Entrenched players continue to fight for enclosure and digital fences, and they have strong resources behind them to lobby legislatures and create propaganda around the world. In addition, language obstacles (the vast majority of OER and OA text is in English) pose a real barrier to development. We must continue to advocate ceaselessly for open world metaphors if we as a society are to realize the benefits of the network in education and in science—benefits that we take for granted in commerce and in culture—and if we are to spread those benefits around the globe to all peoples and nations.

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