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Employing Pedagogical Imagination with Open Educational Resources

The academy and higher education are experiencing a period of rapid change and transformation. The change is driven by a number of factors including, but not limited to, the depressed economy, advances in technology, and the rising higher education price tag. Concern is being expressed by various entities, from the federal government to the parents of prospective students. In the 2013 State of the Union address, the President of the United States put higher education on notice by indicating that the current way of doing business has to change – perpetual increases in tuition cannot continue unchecked (Obama, 2013). However, institutions of higher education are facing greater competition, leading them to invest in more dynamic and innovative programs, as well as effective and creative teaching, all while trying to contain costs. Concurrently, the Open Education Movement – more specifically, the United Nations Educational, Scientific and Cultural Organization (UNESCO) Education for All program, which emphasizes economic development and peace through education – has become a significant player in open education and open learning initiatives (D’Antoni, 2009).

As a result of these two movements, increased awareness has begun to shift how scholarship is disseminated; both producers and consumers of information are pushing to remove content from behind subscription-based, password-protected fortifications to create environments where scholarly material is more open and freely available. While this article is neither a report on the state of higher education, a futuristic report on where higher education may be going, nor an assessment of the Open Education Movement, it is worthwhile to note that some of the influences mentioned above contribute to the creation and use of open educational resources by faculty and librarians to enhance learning strategies at institutions of

higher education. The following sections will provide a brief overview and history of open educational resources (OERs) and conclude with methodologies on how to locate, evaluate, and use OERs to answer the question: What is the librarian’s role in developing and implementing open education resources?

Background and Overview

Open educational resources (OERs) are most commonly referred to as “teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others” (Atkins, Brown, & Hammond, 2007, p.4). OERs include learning content, software tools for using and distributing content, and implementation resources such as licenses governing the use and attribution of both content and tools (e.g., a PowerPoint slide, an audio clip, a video, a picture, a photo, a cartoon, a text document, an e-book, a learning object, a movie clip, a PDF, or an entire online course).

The phrase *open educational resources* is a relatively recent umbrella term codified in 2002 when UNESCO convened the Forum on the Impact of Open Courseware for Higher Education in Developing Countries (Johnstone, 2005). The concept and term are a natural outgrowth of the opportunity the Internet provides, the availability of options in intellectual property (IP) management such as Creative Commons licensing, and the Open Education Movement. The agenda of the Open Education Movement directs that learning is not precluded by barriers ascribed to age, gender, time, geography, cost, or prior learning. The interconnections of these three forces (Internet, IP management, and Open Education) have been a relatively recent phenomenon, which is easily observed with a selective timeline.

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Timeline:

- 1985 - Internet began its journey into commercialization and was officially defined and recognized by the Federal Networking Council (FNC) resolution in 1995.
- 1989 - Licensing of free software began with the General Public License (GNU).
- 1994 - “Learning object” was coined by Wayne Hodgins. The convergence of instructional design and content that could be remixed and applied to a different pedagogical situation was identified.
- 1997 - MERLOT was founded and continues to be the largest aggregator of learning objects.
- 1998 - Open source software community became an official organization and encouraged the usage of the word open rather than free.
- 2001 - Lawrence Lessig founded Creative Commons, following the example of the open software community, to allow authors of creative content to license their materials such that their work can be used by the public as they have designated.
- 2002 - At a UNESCO forum, comprised of people whose goal was to “gather together a universal education system available to the whole of humanity,” the often quoted definition of an OER was adopted.
- 2002 - MIT with support from the William and Flora Hewlett foundation determined to publish all their courses online so that the public could access them for free as long as the public did not use them commercially.
- 2007 - The worldwide educational community met in Cape Town South Africa and produced the Cape Town Open Education Declaration, a document advocating the continued development and sharing of OERs in support of worldwide education, especially in developing countries.
- 2011 - MIT had nearly 2100 courses online and the Hewlett foundation had spent over 110 million with MIT and other major universities. A partial list of other participating U.S. institutions includes: Tufts University, University of Michigan, University of Notre Dame, Rice University, Yale University, Carnegie Mellon University, and Stanford University.
- 2012 - The first MOOCs were launched in 2012 with Coursera and then Udacity, and edX. All of these models involve free university courses for students with the addition of a certificate upon successful completion of the course and demonstration of mastery of the concepts. Coursera and Udacity are for profit companies that are not currently making a profit. edX is a joint venture between MIT and Harvard with an altruistic as well as research agenda.
- 2012 - Paris OER Declaration was adopted at the World Open Educational Resources (OER) Congress held at the UNESCO Headquarters in Paris.
- 2013 - Open Education Week coordinated by the OpenCourseWare Consortium, an association of institutions and organizations worldwide committed to the ideals of open education. More than 100 universities, colleges, schools and organizations showcased efforts to make education more open, free, and available to everyone.

Learning about Open Educational Resources

It can be challenging to stay current on any issue, especially one that is closely tied to technologies, copyright or licensing issues, and pedagogy. Yet it is necessary to familiarize oneself with recent developments and practices in order to provide the best information to faculty and students. Appendix A offers a number of journals, blogs, listservs, conferences and presentations, licensed proprietary databases, and other resources that provide information necessary to become current on

open educational resources, open education, MOOCs, and related topics. When searching for additional relevant literature, employ these effective search terms: open education, open access, open education resource, open educational resource, open learning resource, massive open online course, learning object, and open classroom.

Copyright, Licensing, and Public Domain

Materials under copyright may not be used in open educational resources (OERs), including massive open online courses (MOOCs), without express permission from the copyright holder. This, at times, creates difficulty and frustration in the development and provision of educational resources that are intended for mass consumption. Additionally, content that is found in resources licensed by university and public libraries (i.e., proprietary journal articles) is usually off-limits for use in open educational resources (and MOOCs) as the instructional environment is outside the parameters of most vendor licenses and outside exceptions afforded by the TEACH Act. Although librarians are familiar with the process of obtaining licenses from either a third party entity, such as the Copyright Clearance Center, or directly from the copyright holder (Morehouse, 2012), sharing – as well as scaling – open educational resources is easier to manage when the content is open. This may include material already in the public domain or materials licensed by a Creative Commons (CC) license, a GNU General Public License (GNU GPL), or a GNU Free Documentation License (GNU FDL).

Creative Commons licensing provides an avenue through which content may be more easily remixed, revised, and shared both for commercial and noncommercial uses. Content creators should be aware that, while a variety of options are available to match their sharing and attribution preferences, licensing specifications are difficult to change once selected. Creative Commons (n.d.) describes six types of licenses:

- **The Attribution License (CC BY)** license allows others to distribute, remix, revise, and build upon the work. This is

not limited to non-profit or educational purposes, but may be used for commercial purposes as well. This license is intended for the maximum dissemination and use of licensed content. Users must credit the original creator of the content.

- **The Attribution-ShareAlike (CC BY-SA)** license allows others to remix, revise, and build upon the work for both noncommercial and purposes. Users must credit the originator of the content and license their new creations under identical terms. Derivatives created from the original content would be likewise licensed with the Attribution-ShareAlike license, and would also be available for commercial use.
- **The Attribution-NoDerivs (CC BY-ND)** license allows others to use and redistribute the content without remixing or changing the content in any manner. It may be used for both commercial and noncommercial purposes. The user must give credit to the author/creator of the content.
- **The Attribution-NonCommercial (CC BY-NC)** license allows others to remix, revise, and build upon the work for noncommercial purposes. Any derivative works must both credit the original author and be noncommercial. However, the user need not license the derivative work with the same license.
- **The Attribution-NonCommercial-ShareAlike (CC BY-NC-SA)** license allows others to remix, revise, and build upon the work non-commercially, as long as the user credits the original author/creator and licenses the content under the same license.
- **The Attribution-NonCommercial-NoDerivs (CC BY-NC-ND)** license is considered to be the most restrictive of the six most commonly licenses. This license allows users to download original works and share them with others only as long as the original author/creator is credited, the user does not change the content, in part or in whole, and the content is not used commercially.

Librarians are in an excellent position to model innovation ...

... Librarians have a cross-disciplinary vantage point within the academy, offering a unique opportunity to share information, skills, and resources.

Additionally, the Creative Commons website provides information on the process of licensing a work according to one's use and distribution preferences. The author/content creator is guided in selecting the appropriate license and providing the information necessary for others to give attribution for the content used. The GNU General Public License applies to free software, and the GNU Free Documentation License applies to the documentation for the free software (Free Software Foundation, 2013). Finally, the public domain includes items for which the copyright term has expired, items created by the federal government, items created and released to the public domain, or those materials ineligible for copyright protection. Materials in the public domain are free to be used in open educational resources. Do not presume that easily accessible resources are inherently public, however; materials found on the open Web should be assumed to be within copyright unless otherwise specified.

How to Discover OERs

Open educational resources can be found via the open Web using a search engine or by reading journal articles that discuss and list various OERs. They can also be found on the personal websites of educators, on university websites, and in digital courseware. Although there is no standardization of descriptive categories or metadata for OERs, search engines, specific OER portals, and individual OER repositories will yield significant results.

Google's advanced search allows the searcher to set a filter designating the type of usage rights desired. You can direct other search engines to do the same by limiting to results licensed with Creative Commons Licenses (CC). OER portals lead to collections of resources organized by subject, discipline, or type of resource. The portals are usually established for a specific mission, by a group of contributors, with a funding plan, and for a particular audience. The types of OERs available and the organization of the portal reflect these specifics.

For example, the Internet Archive was established in 1996 as a non-profit corporation

for the purpose of "offering permanent access for researchers, historians, scholars, people with disabilities and the general public to historical collections that exist in digital format" (Internet Archive, n.d., para.1). The Internet Archive's collections include web sites, videos, texts, audio clips, and other digitization projects. Individual collections of OERs or repositories acquire their organization structure from their home organization or institution, as well. The Chem Collective is a project of the National Science Digital Library with goals "to support a community of instructors interested in improving chemistry education through interactive and engaging online activities" (National Science Digital Library, n.d., para.1). The site offers useful online resources for teaching and learning chemistry, including pre-written activities ready for classroom use. The site solicits feedback from instructors who use the activities for ongoing updating and improvements.

Locating materials in the public domain can be done in a similar way. When using search engines, limit results to materials found within the public domain. Learn to scan a website for usage information or copyright restrictions. Assume that everything found on the Web is within copyright restriction until the permissions license is located or the information on the website meets the criteria for being in the public domain, e.g., copyright has expired, the work was created by the United States government, or the creator licensed the material to the public domain (CC0).

(Lists of OER and public domain collections can be found at the end of the article in Appendix C.)

Benefits and Barriers

The purpose for employing open educational resources (OERs) is to augment and enhance instruction and learning. As with any information resource that is tied to technology, there are both benefits and barriers associated with development and use. The benefits of open educational resources can be categorized as economic, pedagogical, and social (Andreatos & Katsoulis, 2012; Baraniuk, 2012; Hilton &

Wiley, 2010; Illowsky, 2012; D'Antoni, 2009; Kortemeyer, 2013; McCrea, 2013; Olcott, 2012) as seen in the following bulleted list.

- Bridging the gap between formal and informal learning (i.e., enabling a professor to easily flip the classroom, allowing face-to-face discussion with instruction provided online before class).
- Connecting instruction to learning (i.e., allowing a professor to augment or reinforce a particular concept, system, or idea with a tool, such as an interactive tutorial where there is a textbook weakness or limited instruction time).
- Encouraging and enhancing lifelong learning (i.e., allowing material to be presented within the learner's own time, environment, and interest).
- Engaging and involving students in the learning process (i.e., allowing students to locate and curate their own course-directed content and then using that material to teach classmates about a particular aspect of the course).
- Scaling effectively (i.e., allowing resources to be viewed by 10 or 100,000 students at the same time without economic implications).
- Promoting the research and scholarship of the faculty, students, and institution (i.e., allowing others to see the work being done at the institution highlighting areas of particular importance).
- Sharing information and knowledge within academia (i.e., allowing students and faculty collaborations to be discoverable as well as providing access to the tools, learning objects, or materials for further collaboration).
- Reducing the expense of student textbooks and course packs (i.e., allowing textbooks and course materials to be free or greatly reduced in price).
- Updating content economically and in real time (i.e., materials that are time sensitive can be updated quickly and without waiting for the next "print edition").

Similarly, the barriers to using open educational resources may be categorized as economic, pedagogical, and social. However, other than the current lack of quality and standardization, the pedagogical barriers are fewer than those under the economic and social barrier categories.

- General understanding about the value and usefulness of OERs (i.e., faculty are used to peer-reviewed resources, written by colleagues in their field, and published by reputable publishers). Promotion and tenure hinge on appropriate publication, and OERs are not currently acceptable to most tenure committees. Therefore, the time, effort, and desire to create open resources is not supported within most current faculty cultures.
- Quality control (i.e., most OERs lack peer-review or an editorial staff who can check content for facts and conceptual correctness).
- Cultural and language barriers (i.e., OERs are not available in all languages nor are they always created with appropriate cultural sensitivity).
- Legal concerns (i.e., a current understanding of intellectual property laws and proper adherence to licensing conventions are necessary to create, use, remix, reuse, and disseminate OERs within legal boundaries).
- Technological issues (i.e., the lack of broadband access, the lack of the necessary skillsets to use the various technologies, and the inability of all platforms to interface properly can create major challenges).
- Adaptive concerns (i.e., OERs are not always created to be compliant with Section 508 of the 1998 Amendment to the US Rehabilitation Act).
- Economic concerns (i.e., funding for OERs is usually done at the institutional level through initiatives, grants, and federal funding). None of these funding sources are stable or can be considered long-term.
- Policy (i.e., policies within institutions regarding the funding, creation,

dissemination, quality, curation, and updating of OERs are currently in initial stages).

- Sustainability (i.e., currently grassroots organizations, educational institutions, and governments are experimenting with the potentials of OERs). The systems, policies, funding sources, and technological capacities need to be more fully explored to determine the sustainability of OERs.
- Discoverability (i.e., inadequate metadata undermines the discoverability of OERs).

Evaluation

As consideration is given to developing and using open educational resources in either the instruction the librarian provides or in collaboration with teaching faculty to develop and use OERs in their instruction, it is best to be cognizant of evaluative criteria as not all OERs are of appropriate quality or will be useful for the purpose(s) needed. As with print, electronic and Web-based content, one must evaluate the information for authority/credibility, accuracy, coverage, currency, and relevance (C. Thomes, personal communication, June 22, 2012).¹ While this list is important, the pedagogical applications of an OER are equally important. Achieve, Inc. developed a series of eight rubrics to determine the viability of a given open educational resource. Birch and Scott synthesized these eight rubrics into one rubric applicable to assessing OERs for use in higher education. The rubric provides criteria for determining pedagogical effectiveness in addition to the other criteria defined by Achieve. Pedagogical effectiveness includes such factors as support of learning objectives, enhanced learning through interactive and immediate feedback, and concentrated coverage of topics presented during instruction or assigned reading. (This rubric is available in Appendix B.)

Discussion (Role of Librarians/Libraries)

The discussion of the development and implementation of open educational resources (OERs) is incomplete without considering the library or librarians' role. Librarians are

teachers – in the classroom and at the reference desk. As teachers, librarians understand the process of learning, the role of curriculum, and the call and responsibility of the teacher (2 Timothy 2:15, James 3:1–2, Romans 2:21, Romans 12:6–7). The professional training of a librarian includes the following competencies: the life cycle of information, search strategies and conventions, creation and use of metadata, curation of content, evaluation of sources, blending resources and tools, a pedagogical understanding of the education process, and instructional practice. Additionally, librarians are conscientious about the ethical and legal use of information (i.e., citing sources, copyright, patents, and licenses).

The librarian's acumen is commensurate with the skill sets required to develop, discover, and employ OERs for instruction. The work of locating viable resources to add to course guides and other related research support is a part of what the librarian does to assist with curricular and research support (Seacrest, Afnan-Mans, & Deboo, 2013). Librarians assist faculty with obtaining the necessary permissions to use copyright-protected content, and could continue to provide assistance within this new "open environment" by assisting in the understanding of the license process and the definition of the public domain (Schwartz, 2013). Librarians provide metadata for the curation of faculty and student-created content for institutional repositories and for specific collections included in catalogs or archival collections. This role could continue with the creation of metadata for curated OERs. Librarians provide information literacy instruction to enhance students' searching ability and evaluative skills in determining relevance and validity. Additionally, locating and evaluating OERs for use in particular classes to augment instruction, create engagement, or fill gaps in understanding are also within the purview of librarian training. The pedagogical lens and an understanding of learning are necessary tools to assist in that collaboration. Further, the librarian is versed in many technological skills. The librarian has been dealing with various platforms, interfaces, and issues of interoperability since the digitization of the card catalog.

The librarian's ability to blend technology, instructional pedagogy, and course concepts is well-suited to the development, deployment, and curation of OERs. Finally, librarians have a cross-disciplinary vantage point within the academy, offering a unique opportunity to share information, skills, and resources. Perhaps the most consequential contribution librarians can make to the dialogue about OERs is to communicate and educate the academy about

the potential of OERs to enhance student learning. Librarians are in an exceptional position to model innovation and relevant utilization of open educational resources within their own instruction and within collaborative efforts with faculty.

(An alphabetical listing of referenced websites is included in Appendix D.) †

Appendix A

Resources Regarding Open Educational Resources

Journals

- American Journal of Distance Education
- Distance Education
- Distance Learning
- European Journal of Open Distance and E-Learning
- International Journal of Education and Development Using Information and Communication Technology
- International Review of Research in Open and Distance Learning
- Journal of Asynchronous Learning Networks
- MERLOT Journal of Online Learning and Teaching
- Open Education Journal
- Open Learning
- Quarterly Review of Distance Education
- Research in Learning Technology

Blogs

- College Open Textbooks BLOG
- Community College Consortium for OERs BLOG
- Creative Commons BLOG
- Education Week BLOG
- Open Course Library BLOG
- Open Educational Resources BLOG
- OERWA Share

List Serves

- EDUCASE OPENNESS
- UNESCO International Community on OERs

Conferences/Presentations

- EDUCAUSE Library Archive – Open Educational Resources (OER)
- Open Education Conference, November 6-8, 2013, Park City, Utah, USA

Initiatives

- UKOU – United Kingdom Open University
- OER Africa
- Center for Open Educational Resources and Language Learning (COERLL)
- Budapest Open Access Initiative
- Open Access Initiative at Berkeley
- A World Map of Open Educational Resource Initiatives

Appendix B

Open Educational Resources Evaluation Rubric

Categories of Criteria	3 – Superior	2 - Limited	1 – Weak/NA
Alignment to Course Objectives <ul style="list-style-type: none"> Alignment to individual course objectives 	Course objective fully aligned and addressed comprehensively.	Course objective partially aligned and addressed.	Course objective neither aligned nor addressed.
Explanation of the Subject Matter Is the <ul style="list-style-type: none"> Content valid and appropriately current? Content understandable by target audience? Content authoritative and appropriate (age level, language, visuals, and cultural sensitivity)? Does the <ul style="list-style-type: none"> Content present main ideas clearly? Content connect associated concepts? 	Content is valid, appropriately current, understandable by target audience, authoritative, and appropriate. Content presents main ideas clearly and connects to associated concepts.	Content is partially valid, less than appropriately current, garners less than complete understanding by target audience, is incomplete in elements of authority and appropriateness. Content presents most main ideas clearly and connects to some associated concepts.	Content is invalid, outdated, not understandable by target audience, deficient in authority and appropriateness. Content neither presents main ideas clearly nor connects associated concepts.
Utility for Instruction <ul style="list-style-type: none"> Are instructions for use provided? Do the components of the OER function as intended? Does functionality require specific software or hardware? Is the OER licensed for open use? (CC license for reuse, remix, revise, redistribution) Is content adaptable or revisable? Is metadata available? 	Comprehensive instructions are provided; components function as intended; functionality does not require additional software or hardware; OER is licensed for open use; content is adaptable and revisable; and, metadata is available.	Instructions are incomplete; some components do not function as intended; some functionality does require additional software or hardware; OER license is partially open; content is not easily adaptable and/or revisable; and, metadata is incomplete.	Instructions are not provided; components do not function as intended; functionality requires additional software or hardware; OER is not licensed for open use; content is not adaptable and/or revisable; and, metadata is not available.
Quality of Assessment <ul style="list-style-type: none"> Is assessment aligned to the content? Does the assessment measure and appropriately weight the major concepts of the content? Does the structure of the assessment support an accurate measurement of proficiency? 	Assessment is aligned to the content; measures and appropriately weights the major concepts of the content; and, the assessment structure supports an accurate measurement of student proficiency.	Assessment is moderately aligned to the content; inconsistently measures and weights the major concepts of the content; and, the assessment structure compromises an accurate measurement of student proficiency.	Assessment is misaligned to the content; does not measure or appropriately weight the major concepts of the content; and, the assessment structure does not support an accurate measurement of student proficiency.

Categories of Criteria	3 – Superior	2 – Limited	1 – Weak/NA
Quality of Technological Interactivity <ul style="list-style-type: none"> Does the OER functionality allow individualized learning by being flexible or adapting to individual control? Is the OER functionality well designed and functions as expected on the intended platform? Does the OER functionality invite student use or encourage learning? 	Functionality allows an individualized learning experience; is well-designed; and, encourages student use or learning.	Functionality moderately allows an individualized learning experience; the design is deficient in some areas; and, may not encourage student use or learning.	Functionality does not allow an individualized learning experience; has design flaws; and, discourages student use or learning.
Quality of Instructional and Practice Exercises <ul style="list-style-type: none"> Does the OER offer more exercises than needed for the average student to master elementary content? Does the OER offer one to two rich practice exercises for complex content? Are exercises clearly written? Are exercises keyed and scored with appropriate documentation? Is there a variety of exercise types and formats appropriate for the intended content? 	OER offers appropriate number of exercises for mastery of elementary and complex content; offers clearly written, keyed, and scored exercises with documentation; and, provides a variety of types and formats of exercises.	OER offers an insufficient number of exercises for mastery of elementary and complex content; question clarity or documentation for keying or scoring is insufficient; and, provides little variety in types and formats of exercises.	OER lacks an appropriate number of exercises for mastery of elementary and complex content; does not offer clearly written, keyed, and scored exercises with documentation; and, provides no variety of types and formats of exercises.
Opportunities for Deeper Learning <ul style="list-style-type: none"> Does the OER offer opportunities for deeper learning by incorporating at least three of the following: <ol style="list-style-type: none"> Thinking critically and solving complex problems Working collaboratively Reasoning abstractly Constructing viable arguments and critiquing the reasoning of others Communicating effectively Applying discrete knowledge to real world situations Constructing, using, or analyzing models? Does the OER offer a range of cognitive demand that is appropriate and supportive of content? Does the OER provide appropriate scaffolding and direction? 	OER provides opportunity for deeper learning through at least three areas of higher level thinking skills; offers a range of cognitive demand commensurate with the content; and, provides appropriate direction and scaffolding.	OER provides opportunity for deeper learning through fewer than three areas of higher level thinking skills; offers a range of cognitive inconsistently matched with the content; and, provides incomplete direction or scaffolding.	OER does not provide opportunity for deeper learning through higher level thinking skills; does not offer a range of cognitive demand commensurate with the content; and, does not provide appropriate direction or scaffolding.
Accessibility <ul style="list-style-type: none"> Does the OER comply with current ADA accessibility standards? http://aim.cast.org/learn/e-resources/accessibility_resources 	Components and functionality of OER comply with current ADA accessibility standards.	Parts of OER components or functionality comply with current ADA accessibility standards.	OER does not comply with current ADA accessibility standards.



*Birch and Scott created this rubric by synthesizing the Eight Rubrics developed by ACHIEVE, under the Creative Commons Attribution 3.0 License.

Appendix C

Selective Listing of Open Educational Resources

Portals to Multi-Disciplinary Collections of OERs

Many of the sites allow users to create a free account and to search for and save OERs, as well as to create new OERs and share them with others.

- Connections – Rice University’s repository of learning objects in a range of disciplines.
- Curriki – Repository of learning objects, full courses, and lesson plans for K-12.
- DOAJ – Directory of Open Access Journals maintained by Lund Universities in Sweden.
- FREE: Federal Resources for Educational Excellence – 1500+ resources from federal agencies that support teaching and learning.
- Internet Archive – Aggregated content including videos, courses, and lesson plans from universities in the United States and China.
- JSTOR – Access to some free articles and articles published prior to 1923.
- Khan Academy – Short tutorials on a specific concept.
- MERLOT – Aggregation of learning objects, full course curricula, assessment tools, etc. and tools for creating OERs.
- OpenAccessDirectory – List by subject of open resources curated by Simmons University.
- Open Access Theses and Dissertations
- OER Commons – Repository for learning objects, full course materials, lesson plans, etc. and tools for creating OERs.
- Open Course Ware Consortium – Repository for courses – collaboration of higher education institutions and associated organizations from around the world.
- Open Culture – List of Courses by discipline.
- Open Learn – Open University’s (UK) repository of courses.
- Open Tapestry – Repository for higher education courses.
- Saylor Foundation – Repository for higher education courses.

Links to selected OER sites created by U.S. universities

- ArXiv – Cornell University (Open e-print archive – articles in physics – mathematics – computer science)
- Carnegie Mellon Open Learning Initiative
- Foothill: De Anza Community College District Sofia Project
- JHSPHOPEN: Johns Hopkins University
- MIT OpenCourseWare
Open Course Library – Washington State Legislature
Orange Grove: Florida Public Higher Educational Institutions
- Stanford University Engineering
- Tufts OpenCourseWare
- University of Notre Dame OpenCourseWare
- Utah State University OpenCourseWare
- U.C. Berkeley’s YouTube Channel
- USG Share: University System of Georgia
- Wisc-Online
- Yale Open Courses

Selected list of sites that offer subject-specific OERs

- AMSER (Applied Math and Science Education Repository)
- Chemistry Collective
- Harvard Open Collections Program (History)
- HEAL (Health Education Assets Library)
- iLumina (Sciences)
- National Science Digital Library
- Open KSA (Lectures from Knowlton School of Architecture at Ohio State University)
- PLOS (Public Library of Science)
- Scirus (Sciences)

Image Sources

- Every Stock Photo – Search engine for free stock photos licensed under Creative Commons, public domain, or GNU licenses.
- Morgue File – Free high resolution images for personal or commercial use, under this license.
- Library of Congress – The Library of Congress Prints and Photographs Online Catalog offers digital images of much of the Prints and Photographs Division's holdings including architecture, design and engineering, among other categories.
- PhotoEverywhere.co.uk – Images of travel with Creative Commons licenses.
- Public Health Image Library (PHIL) – The U.S. Department of Health and Human Services Centers for Disease Control and Prevention provides a searchable database of photographs, micrographs and illustrations relating to public health. Most images are public domain; some are copyrighted and require permission for use.
- US. Government Photos and Images – Images created by the Federal Government and therefore within the public domain.
- Wikimedia Commons – Contains Creative Commons licensed material as well as public domain material.

Selected List of sites devoted to open textbooks

- BookBoon
- CK-12 Flex Books
- College Open Textbooks
- Flat World Knowledge
- Global Text Project
- Lulu
- Merlot
- Open Culture
- OpenStax College
- Open Textbooks
- Student PIRGS Open Textbooks Catalog
- Textbook Revolution
- Text Books Free
- University of Minnesota Open Textbook Catalog
- Wiki Books

Appendix D

List of Referenced Websites

- Achieve, Inc.:
<http://www.achieve.org/oer-rubrics>
- Budapest Open Access Initiative:
<http://www.budapestopenaccessinitiative.org/>
- Cape Town Open Education Declaration:
<http://www.capetowndeclaration.org/>
- Center for Open Educational Resources and Language Learning (COERLL) (Initiative):
<http://www.coerll.utexas.edu/coerll/grants>
- Chem Collective:
<http://www.chemcollective.org/>
- College Open Textbooks BLOG:
<http://www.collegeopentextbooks.org/blog/>
- Community College Consortium for OERs BLOG:
<http://oerconsortium.org/>
- Coursera:
<https://www.coursera.org/>
- Creating a Creative Commons License:
<http://creativecommons.org/choose>
- Creative Commons:
<http://www.creativecommons.org/>

- Creative Commons BLOG:
<http://creativecommons.org/weblog/>
- Creative Commons License:
<http://creativecommons.org/licenses/>
- Education Week BLOG:
<http://www.edweek.org/ew/section/blogs/index.html>
- EDUCAUSE Library Archive – Open Educational Resources (OER) (Presentation):
<http://www.educause.edu/library/open-educational-resources-oer>
- EDUCASE OPENNESS (Listserv):
<http://listserv.educause.edu/cgi-bin/wa.exe?SUBED1=openness&A=1>
- edX:
<https://www.edx.org/>
- Federal Networking Council (FNC) resolution:
<http://www.internetociety.org/internet/internet-51/history-internet/brief-history-internet/>
- Google Advanced Search:
<http://www.google.com>
- Hewlett Foundation:
http://en.wikipedia.org/wiki/William_and_Flora_Hewlett_Foundation
- Internet Archive:
<http://archive.org/about/>
- Learning Object:
http://edutechwiki.unige.ch/en/Learning_object
- Licensing of Free Software:
http://en.wikipedia.org/wiki/GNU_General_Public_License
- MERLOT:
<http://about.merlot.org/howmerlotstarted.html>
- MIT:
<http://ocw.mit.edu/index.htm>
- Open Access Initiative at Berkeley (Initiative):
<http://oa.berkeley.edu/>
- Open Course Library BLOG:
<http://blog.ocw.mit.edu/>
- Open CourseWare Consortium:
<http://www.ocwconsortium.org/>
- Open Education Conference, November 6–8, 2013, Park City, Utah, USA:
<http://libguides.georgefox.edu/openedconference.org/%E2%80%8E>
- OER Africa (Initiative):
<http://www.oerafrica.org/>
- Open Education Week:
<http://www.openeducationweek.org>
- Open Educational Resources BLOG:
<http://blog.oer.sbctc.edu/>
- OERWA Share:
<http://elc-oer.blogspot.com/>
- Open Source Software:
<http://opensource.org/>
- Paris OER Declaration:
http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/Events/English_Paris_OER_Declaration.pdf
- Public Domain and Creative Commons License:
<http://libguides.lib.umt.edu/PublicDomainCC>
- Udacity:
<http://www.udacity.com/>
- United Kingdom Open University (UKOU) (Initiative):
<http://www.open.ac.uk/about/main/>
- UNESCO Forum:
http://wikieducator.org/OER_Handbook/educator_version_one/Introduction/Defining_OER
- UNESCO International Community on OERs (Listserv):
<https://communities.unesco.org/wws/info/iiep-oer-opencontent>
- William and Flora Hewlett Foundation:
<http://www.hewlett.org/>
- A Report on Open Educational Resource Initiatives:
<https://oerknowledgecloud.org/?q=content/world-map-open-educational-resources-initiatives-can-global-oer-community-design-and-build-i>

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ENDNOTES

- 1 Thomes, a librarian at University of Maryland University College, conducts a workshop on open educational resources for faculty. The title of the workshop is: *Using Open Educational Resources to Enhance Teaching and Learning*.