Open Educational Resources

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Introduction to Open Educational Resources (OERs)

Mike Smith, Director of the Hewlett Foundation Education Program, one of the earliest supporters of Open Educational Resources (OERs), said, "At the heart of the open educational resources movement is the simple and powerful idea that the world's knowledge is a public good and that technology in general and the World Wide Web in particular provide an extraordinary opportunity for everyone to share, use, and reuse that knowledge" (Smith & Casserly, 2006, p. 10). This quote accurately captures the major ideas associated with the OER movement – to promote a wider access to high-quality education across the globe. OER imply that a resource is available free of cost and that it grants the following four permissions free of cost, also known as the **'the four Rs' of OER** (Wiley, 2017):

- **Reuse:** the content can be reused in its unaltered/verbatim form (e.g., make a backup copy of the content).
- **Revise:** the content can be modified, adjusted, or altered (e.g., adapt the content of an existing course or e-textbook for your students, or translate the content into another language).
- **Remix:** the content (in its original or revised form) can be combined with other content to create a new resource (e.g., incorporate the content into a new e-textbook).
- **Redistribute:** copies of the original content, the revisions, or the remixes can be shared with others (e.g., post a copy on the Web, or give a copy to students).

OERs use a license that supports open use of the content, e.g., Creative Commons license, or can be accessed outside of copyright regulation in the public domain. OERs can appear in a number of different forms. For instance, they can be compiled and shared as open textbooks or e-texts. OERs can be combined with commercial content as well. OERs range in size. They can appear as an individual OER such as lesson plans, or they can include whole courses as for MIT open courseware (http://ocw.mit.edu/) and Massive Open Online Courses (MOOCs).

While many OERs are available on the Internet, OERs can be in any medium: books, worksheets, photographs, videos, and more. OERs also can be in multiple languages. There is an increasing number of open textbooks available for school students.

Examples of OERs highlighted in Bell (2019) include:

- Content-based resources
  - Courses and resources/material for courses
  - Content modules
  - Various collections
  - Journals

- Tools, or software that can support the development, sharing, use, and iterative improvement of OER content. Examples include:
    - Content search and organization "searching and organization of content"
    - Management systems for content and learning
    - Tools for content development
    - Online learning communities
- Implementation resources involving intellectual property licenses that enable open publishing of the following:
    - Materials
    - Design principles
    - Adapt to fit local context.

Hilton (2016) synthesized the results of 16 articles that investigated how OERs, like e-textbooks, affect learning in higher education and how students and instructors perceive OERs. Overall, students demonstrate a similar academic achievement when OER are utilized, and both instructors and students have generally positive attitudes toward OER. In addition, OERs help students save considerable amounts of money, thus promoting more equitable and inclusive education.

Implementation

OER Selection

Not all OERs are of high educational quality or suitable for all types of learning contexts or learners. Therefore, before using an open educational resource it is important to evaluate it. As a first step, it is important to think about the criteria that you will use in selecting useful OERs. These criteria may include:

- Accuracy
- Reputation of author/institution
- Standard of technical production
- Accessibility
- Fitness for purpose
- Clear rights declarations, e.g., Creative Commons license (supports open use of the content).

OER Evaluation

With this in mind, consider the following important questions when evaluating the selected OER:

1. Who is your target audience for the OER and what do you want them to learn?
2. What is the context of your instruction? Is this a course or a free-standing resource?
3. Can the OER content be described as follows and why?
    a. Relevant, accurate, appropriate level of detail, objective, current and jargon-free
    b. Of good provenance (consider the reputation of the author/institution), with a list of references if appropriate
    c. Free of advertising
4. Does it fit your chosen pedagogy? Why?

a. Learning outcomes are stated and match with learner's needs
   b. Engaging and interactive
   c. Set at the appropriate level, with any prerequisite skills/understandings stated
   d. The time required to study is stated and equates to the importance of the learning outcomes achieved
5. How does it measure up to usability/accessibility standards?
   a. Easy-to-use and well presented, with clear navigation
   b. Accessible for users with disabilities and conforms to accessibility guidance
6. How genuinely reusable is it?
   a. A standalone resource that can be reused in different contexts
   b. Robust and functional, and works on different browsers/platforms
   c. Rights are fully documented. For example: Does it carry a clear Creative Commons or other rights declaration? Is it OK to reuse it? Are there any conditions?

Frequently Asked Questions

a. *What are the key characteristics that identify an OER?* The distinguishing feature of OERs is their license, which allows other people to use the resource without paying a fee. Anyone can write an OER and use many different software packages.

b. *Are OER synonymous with distance/online learning*? OERs are usually shared online but can be in print or offline. They can be used in face-to-face teaching as well as distance learning

c. *Can OER be always adapted for particular use*? OER can always be re-used without permission of the author, but they can only be adapted if the license allows this.

d. *How do I find OERs*? Online search engines such as Mason OER Metafinder (https://oer.deepwebaccess.com/oer/desktop/en/search.html) and OASIS (Openly Available Sources Integrated Search, https://oasis.geneseo.edu/) can be helpful. In addition, contact a librarian who is a subject specialist in your area for support (Bell, 2019).

e. *What do I need to do if I want to edit an OER before using it*? Nothing! Just edit away. How you edit it will depend on the specific OER. You don't need to notify anyone. Since all OERs should follow the "four Rs" rule, you can do whatever you want, such as edit and share freely.

f. *Can you receive notifications of newly edited content in an OER, if it is online*? It depends on the platform on which the OER was published. For example, if you subscribe to a MOOC, you usually can ask to receive notification from the course. In other cases, this notification may not be available.

g. *Are OER are all high-quality resources*? With OER, the author retains the copyright but allows others to use it without paying a fee, and hence could enable greater access to learning opportunities. But the quality of OER is variable. You need to evaluate the OER for your learners – however, being open for scrutiny and feedback from other users can lead to improvements in the quality of the resources.

h. *What if I have additional questions not addressed here*? Please visit a Frequently Asked Questions forum such as OER FAQ (http://discourse.col.org/c/open-educational-resources-faq)

Resources for OER Teaching Tool in a Flash

OpenCourseWare (OCW), Open Access Contents, and Open Educational Resources (OER)*

1. Academic Earth: http://academicearth.org
2. ALT Open Access Repository: http://repository.alt.ac.uk/887/ and http://repository.alt.ac.uk/
3. Book-TV: http://www.booktv.org/
4. C-Span: http://www.c-spanvideo.org/videoLibrary/
5. The China Open Resources for Education project: http://www.core.org.cn/en/ and http://www.core.org.cn/a/About-CORE.html
6. Chronicling America: Historic American Newspapers: http://www.futureofthebook.org/iraqreport/1-precipitate-withdrawal/
7. Complete Works of Charles Darwin Online: http://darwin-online.org.uk/
8. The Complete Works of William Shakespeare: http://shakespeare.mit.edu/
9. Connectivism and Connected Knowledge 2011 (Instructors: George Siemens and Stephen Downes): http://cck11.mooc.ca/
10. Connexions from Rice University: http://cnx.org/
11. Edgar Allan Poe Society of Baltimore: http://www.eapoe.org/
12. Educational Resources Center for California: http://grou.ps/oercenter/
13. eduMOOC (Massive Open Online Course): Online Learning Today…And Tomorrow http://sites.google.com/site/edumooc/
14. Einstein Archives Online: http://www.alberteinstein.info/
15. Encyclopedia of Life: http://www.eol.org/
16. EveryStockPhoto.com: http://everystockphoto.com/
17. Google Art Project (new Google project that allows visitors to explore museums around the world and view hundreds of artworks): http://www.googleartproject.com/
18. Global Text Project: http://globaltext.org/
19. HippoCampus: http://www.hippocampus.org/
20. iBerry (Open Courseware Directory): http://iberry.com/
21. Intute (to find best resources for study and research): http://www.intute.ac.uk/
22. Jane Austen: http://www.janeausten.org/
23. The Jane Goodall Institute: http://www.janegoodall.org/
24. Japan OCW Consortium: http://www.jocw.jp/index.htm
25. The Johns Hopkins Bloomberg School of Public Health's OCW: http://ocw.jhsph.edu/
26. Jorum: http://www.jorum.ac.uk/
27. Learnist: http://learni.st/category/featured#/category/featured
    Learnist: Share What You Know: http://www.youtube.com/watch?v=QXFWUGGqpJ4;
    Introducing Learnist: http://www.youtube.com/watch?v=cQDEwbgxSOs
    How Learnist Works: http://www.youtube.com/watch?v=ILzYzDnxarw
28. Mars Program (NASA): http://marsprogram.jpl.nasa.gov/mro/
29. MERLOT: http://www.merlot.org/merlot/index.htm
30. MIT OpenCourseWare (OCW) Project: http://ocw.mit.edu/index.html
31. The Museum of Online Museums: http://www.coudal.com/moom/
32. National Repository of Online Courses: http://www.montereyinstitute.org/nroc/
33. OER Commons: http://oercommons.org/
34. OCW Finder: http://opencontent.org/ocwfinder/
35. OER Handbook, WikiEducator: http://wikieducator.org/OER_Handbook

36. Online Dictionaries:
    i. YourDictionary: http://www.yourdictionary.com/;
    ii. Merriam-Webster's Online Dictionary: http://www.m-w.com/;
    iii. Dictionary.com: http://dictionary.reference.com/
37. OpenCourseWare Consortium: http://www.ocwconsortium.org/
38. OpenCourseWare (MIT): http://ocw.mit.edu/index.htm
39. Open Educational Resources Commons: http://www.oercommons.org/
40. The Open Knowledge Foundation: http://www.okfn.org/
41. Opensource Opencourseware Prototype System (OOPS). http://oops.editme.com/
42. Public Library of Science (PLOS): http://www.plos.org/
43. Scitable (from Nature): http://www.nature.com/scitable
44. Sites for Teachers: http://www.sitesforteachers.com/
45. Sophia: http://www.sophia.org/#popular-content (a free social learning community for education)
46. Squidoo: http://www.squidoo.com/
47. Stanford Encyclopedia of Philosophy: http://plato.stanford.edu/
48. Study Stack: http://www.studystack.com/flashcard-136259
49. Timeless Hemmingway: http://www.timelesshemingway.com/
50. Trailblazing (350 years of Royal Society Publishing): http://trailblazing.royalsociety.org/
51. Tufts University's OCW: http://ocw.tufts.edu/
52. Vietnam Fulbright Economics OCW: http://www.fetp.edu.vn/en/opencourseware/
53. Virtual Zooarchaeology project: http://vzap.iri.isu.edu/ViewPage.aspx?id=230
54. WikiEducator: http://www.wikieducator.org/Main_Page
55. Yahoo! Education: http://education.yahoo.com/

Massive Open Online Courses (MOOCs)*
1. Coursera: https://www.coursera.org/
2. Udacity: http://www.udacity.com/
3. EdX https://www.edx.org/

Free and Low-Cost Higher Education*
1. The Floating University: http://www.floatinguniversity.com/
2. Peer 2 Peer University: http://p2pu.org/
   a. Back to School: Peer 2 Peer University and the Future of Education (an interview); September 1, 2009 interview: http://creativecommons.org/weblog/entry/17323
   b. P2PU., An Experiment in Free Online Education, Opens for Business, Chronicle of HE, August 19, 2009, http://chronicle.com/blogPost/P2P-U-an-Experiment-in-Free/7739/
3. Straighterline: http://www.straighterline.com/
   a. Run by Professors: http://www.straighterline.com/courses-run-by-professors.htm
4. Udemy: http://www.udemy.com/
5. University of the People: http://www.uopeople.org/
   a. New York Times, On the Internet A University Without a Campus, February 5, 2009, http://www.nytimes.com/2009/01/25/technology/25iht-university.4.19660731.html
   b. Donald Clark blog post, University of the People, September 21, 2009, http://donaldclarkplanb.blogspot.com/2009/09/university-of-people.html
   c. Marc Parry, Chronicle of HE, August 26, 2009, New Tuition-Free University of the People Tries to Democratize HE, http://chronicle.com/blogPost/New-Tuition-Free-University/7831/

6. World Education University: http://www.theweu.com/

K-12 Focused Open Educational Resources*
1. Curriki: http://www.curriki.com
2. Federal Resources for Educational Excellent project (FREE): http://free.ed.gov/
3. Free-Reading.net: http://free-reading.net/index.php?title=Main_Page
4. Free Rice: http://www.freerice.com/
5. Khan Academy: http://www.khanacademy.org/
6. Lesson Plans Page: http://www.lessonplanspage.com/
7. Library of Congress: Teachers: http://www.loc.gov/teachers/
8. NASA for Educators: http://www.nasa.gov/audience/foreducators/index.html
9. NASA Learning Technology site:
   http://www.nasa.gov/offices/education/programs/national/ltp/home/index.html
10. The National Science Digital Library: http://www.nsdl.org/
11. Nautilus Live: http://www.nautiluslive.org/
12. Ontario Educational Resource Bank: http://www.edu.gov.on.ca/elearning/
13. PBS Teachers: http://www.pbs.org/teachers/
14. Teachers' Domain: http://www.teachersdomain.org/
15. TeAchnology: http://www.teach-nology.com/
16. Thinkfinity: http://www.thinkfinity.org/
17. Sites for Teachers: http://www.sitesforteachers.com/

Open Source Initiatives*
1. Open Source Initiative. (2007). Open Source Initiative (OSI). http://www.opensource.org/
2. Moodle Web site. http://moodle.org/; and Moodle Demo. http://demo.moodle.net/
3. Sakai Web site: http://sakaiproject.org/
4. List of Open Source Tools: http://www.debianhelp.co.uk/tools.htm

Free and Open Source Software Proponents*
1. FM (1998). FM Interviews with Linus Torvalds: What motivates free software developers? First Monday, Retrieved on June 24, 2010, from
http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/583/504
2. Free Software Foundation. (2006). The free software definition. Retrieved on June 24, 2010, from
http://www.fsf.org/licensing/essays/free-sw.html
3. GNU Bulletin. (1987). What is Free Software Foundation? GNU Bulletin 1(3). Retrieved on June 24, 2010, from http://www.gnu.org/bulletins/bull3.html#SEC1.
4. Stallman, R. (1983). Initial announcement. Retrieved on June 24, 2010, from
http://www.gnu.org/gnu/initial-announcement.html
5. Stallman, R. (1985). The GNU project. Retrieved on June 24, 2010, from
http://www.gnu.org/gnu/thegnuproject.html
6. Raymond, E. S. (2000). *The cathedral and the bazaar*. Retrieved on June 24, 2010, from
http://www.catb.org/~esr/writings/cathedral-bazaar/cathedral-bazaar/.

Textbooks**

1. BC Campus Open Ed. https://open.bccampus.ca/find-open-textbooks/
2. LibreTexts. https://libretexts.org/
3. Open Textbook Library. https://open.umn.edu/opentextbooks/
4. OpenStax College Textbooks. https://openstax.org/
5. Open Educational Resource 2017 Textbook List. https://digitalcommons.sacredheart.edu/library_staff/48/

Resources to Build Own Textbook**
1. AcademicPub. http://www.xanedu.com
2. Open Textbooks Toolkit. https://open.bccampus.ca/open-textbook-101/open-textbooks-toolkit/

See also: Discovering open educational resources (OER). https://guides.temple.edu/OER
*courtesy of Dr. Curt Bonk, Indiana University
**courtesy of Dr. Steven Bell, Temple University

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Bell, S. (2019). Discovering open educational resources (OER). Retrieved from
https://guides.temple.edu/OER

Hilton, J. (2016). Open educational resources and college textbook choices: A review of research on efficacy and perceptions. *Educational Technology Research and Development*, 64, 573-590. https://doi.org/10.1007/s11423-016-9434-9

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Wiley, D. (2017). The evolving economics of educational materials and Open Educational Resources: toward closer alignment with the core values of education. In R. A. Reiser & J. V. Dempsey (Eds.), Trends and Issues in Instructional Design and Technology (4th ed.). New York, NY: Pearson Education. Retreived from https://opencontent.org/blog/archives/4859